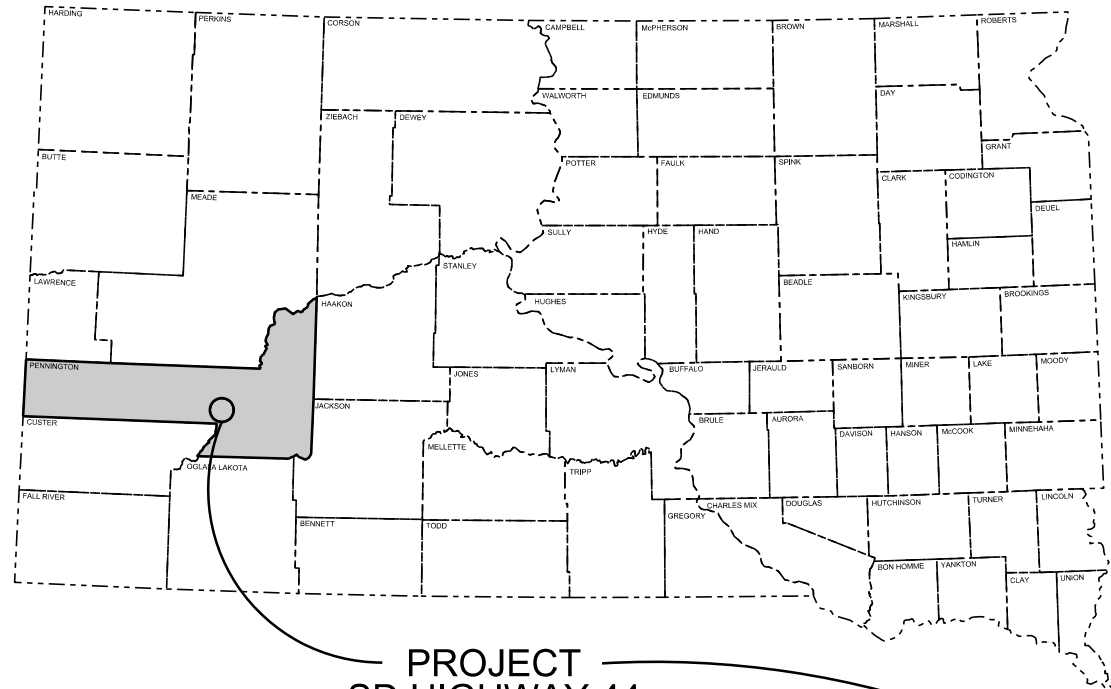


Plot Scale - 1:200

Plotted From - trc12808



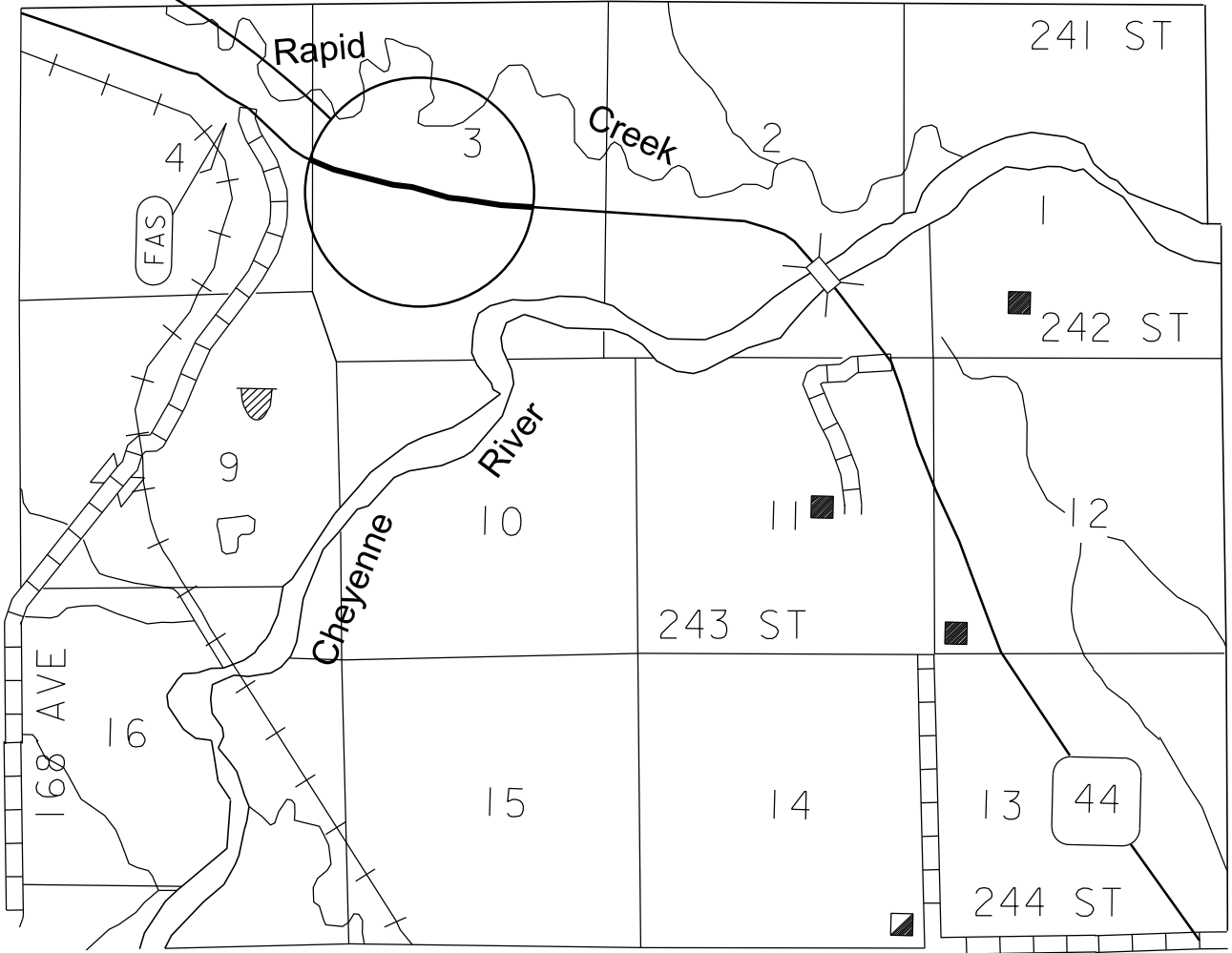
PROJECT
SD HIGHWAY 44
MRM 76.7

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 044-452
SD HIGHWAY 44
PENNINGTON COUNTY

LANDSLIDE REPAIR
i44L

R 12 E



T 2 S

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------------|---------|-------|-----------------|
| | 044-452 | 1 | 56 |

Plotting Date: 08/11/2016

INDEX OF SHEETS

| | | |
|------------|----------|--------------------------------|
| Sheet No. | 1: | Title and Index |
| Sheets No. | 2 - 8: | Estimate Plan Notes and Tables |
| Sheet No. | 9: | Plan Sheet |
| Sheet No. | 10 - 11: | Underdrain Details |
| Sheet No. | 12: | Erosion Control Sheet |
| Sheets No. | 13 - 21: | Standard Plates |
| Sheets No. | 22 - 56: | Cross Sections |

DESIGN DESIGNATION

| | |
|------------|--------|
| ADT (2015) | 1240 |
| ADT (2035) | 1799 |
| DHV | 223 |
| D | 52% |
| T DHV | 3.1% |
| T ADT | 6.9% |
| V | 65 MPH |

STORM WATER PERMIT

Major Receiving
Body of Water: Cheyenne River
Area Disturbed: 3.2 acres
Total Project Area: 3.2 acres
Approx. Begin Lat,Long:
23°54'13.35"N,
102°40'43.77"W

ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|--------------------|--|----------|------|
| 009E0010 | Mobilization | Lump Sum | LS |
| 110E7802 | Remove Fence for Reset | 735 | Ft |
| 120E0010 | Unclassified Excavation | 9,668 | CuYd |
| 120E0300 | Borrow Unclassified Excavation | 10,434 | CuYd |
| 120E6100 | Water for Embankment | 301.5 | MGal |
| 230E0020 | Contractor Furnished Topsoil | 703 | CuYd |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 260E1010 | Base Course | 27.0 | Ton |
| 320E1200 | Asphalt Concrete Composite | 14.0 | Ton |
| 430E0700 | Precast Concrete Headwall for Drain | 2 | Each |
| 620E0510 | Type 1 Temporary Fence | 920 | Ft |
| 620E1020 | 2 Post Panel | 2 | Each |
| 620E4100 | Reset Fence | 735 | Ft |
| 634E0010 | Flagging | 200.0 | Hour |
| 634E0110 | Traffic Control Signs | 137.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 680E0240 | 4" Corrugated Polyethylene Drainage Tubing | 153 | Ft |
| 680E0440 | 4" Slotted Corrugated Polyethylene Drainage Tubing | 1,115 | Ft |
| 680E2000 | Concrete Headwall for Underdrain | 1 | Each |
| 680E2500 | Porous Backfill | 330.0 | Ton |
| 730E0210 | Type F Permanent Seed Mixture | 83 | Lb |
| 731E0200 | Fertilizing | 2.40 | Ton |
| 732E0100 | Mulching | 3.2 | Ton |
| 734E0154 | 12" Diameter Erosion Control Wattle | 930 | Ft |
| 831E0400 | Impermeable Plastic Membrane | 20 | SqYd |

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor shall adhere to the “Special Provision Regarding Storm Water Discharges to Waters of the State”.

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: <http://www.sddot.com/business/environmental/stormwater/Default.aspx>

DENR: <http://www.denr.sd.gov/des/sw/stormwater.aspx>

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form:

The “Department of Environmental and Natural Resources – Contractor Certification Form” (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at: <http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf>

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources, to include fossils, is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

UTILITIES

The Contractor shall be responsible for locating and protecting any utility that would conflict with any work. Utilities are not planned to affected on this project. If utilities are identified to be affected through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

SEQUENCE OF OPERATIONS

The intent of the plan sequence of operations is to have the least amount of impact on the traveling public and adjacent landowners. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of two weeks prior to potential implementation. Work shall proceed according to the following sequence or as approved by the Engineer:

1. Set up temporary traffic control.
2. Place temporary fence.
3. Remove existing fence for reset.
4. Place wattles.
5. Excavate slope.
6. Place underdrain tubing, porous backfill, and underdrain headwalls and backfill trench.
7. Place embankment.
8. Place erosion control measures.
9. Reset fence.
10. Remove temporary fence.
11. Remove temporarytraffic control.

HORIZONTAL ALIGNMENT DATA

| Type | Station | | | Northing | Easting |
|------|----------|-------------|--------------------|------------|-------------|
| POB | 0+00.00 | | | 580771.176 | 1351149.733 |
| | | TL= 841.41 | S 75^47'50" E | | |
| PC | 8+41.41 | | | 580564.732 | 1351965.423 |
| PI | 8+43.32 | R = 1018.00 | Delta = 0^12'52" L | 580564.264 | 1351967.27 |
| PT | 8+45.22 | | | 580563.804 | 1351969.119 |
| | | TL=653.67 | S 76^00'42" E | | |
| POE | 14+98.89 | | | 580405.797 | 1352603.4 |

CLASSIFICATION OF EXCAVATION

All materials encountered during the construction of this project, regardless of their nature or the manner in which they are excavated, will be considered Unclassified Excavation.

Most of the material encountered should be able to be excavated using conventional methods. Prospective bidders are encouraged to review the geology report compiled by the SDDOT Geotechnical Engineering Activity and observe the project conditions in the field. The geology report is available at the Rapid City Area Office.

UNSTABLE EXCAVATION

Unstable Excavation will be required throughout the project limits to excavate saturated or weak compressible soils and other organic materials. A nominal 5 ft. depth of compressible material is anticipated to be removed from the fill footprint prior to construction of the embankment. The depth of unstable excavation may be adjusted by the Engineer to ensure a solid foundation free of organic, soft, unstable material is prepared. Unstable and/or highly organic material shall be stockpiled for use as topsoil or wasted at a site approved by the Engineer.

LANDSLIDE DEBRIS EXCAVATION

Landslide Debris Excavation will be required at the locations shown on the cross sections. It is anticipated that most of the excavated Landslide Debris can be used in the construction of the berm and mainline inslopes. Borrow will be required to construct the remaining embankment. The Landslide Debris Excavation limits shall not exceed those shown on the cross sections unless directed by the Engineer. The temporary backslope required to excavate Landslide Debris will become unstable over the long-term. However, the temporary 1.5:1 excavated backslope should remain globally stable over the short-term during construction provided that measures are taken to divert runoff away from the slope and regular monitoring of the slope is conducted. Construction activities shall be sequenced to minimize the amount of time the steep temporary backslopes are left exposed and unsupported. Should the embankment begin to show signs of instability during construction, traffic shall be diverted north of the centerline to allow for flattening of the backslopes. Landslide Debris Excavation shall be paid for as Unclassified Excavation.

EMBANKMENT CONSTRUCTION

Embankment construction shall not begin until all unstable compressible materials have been excavated from the embankment footprint to the satisfaction of the Engineer. A suitable embankment foundation consists of compacted soil which does not pump, rut, or otherwise displace when traveled over with construction equipment. Each embankment shall be benched into the existing slopes in accordance with Section 120.3 B.2 of the Standard Specifications. Compaction of the embankment will be according to the Specified Density Method. Minimum density testing requirements shall be one test per zone. Each zone shall be 3 feet in depth. Moisture testing shall remain as per Minimum Sample Testing Requirements.

WATER FOR EMBANKMENT

Water for Embankment is estimated at the rate of 15 gallons of water per cubic yard of Embankment minus Waste.

| Table of Excavation Quantities | | | | |
|-----------------------------------|--------------------------------------|--------------------------------------|-----------------------|--|
| | Unclassified Excavation (CuYd) | Water for Embankment (Mgal) | #Embankment (CuYd) | Borrow Unclassified Excavation (CuYd) |
| | 9668 | 301.5 | 20101.4 | 10434 |
| Total | 9668 | 301.5 | 20101.4 | 10434 |
| # For informational purposes only | | | | |

BASE COURSE

Compaction shall be to the satisfaction of the Engineer.

All other requirements for Base Course shall apply.

ASPHALT CONCRETE COMPOSITE

| Table of Surfacing (2 Lifts - 2" Depth) | | | | |
|---|--|--|--------------------------------------|---|
| | | | Base Course 12" Depth (Ton) | Asphalt Concrete Composite (Ton) |
| Cutoff Drain | | | 27 | 14 |

CUTOFF AND UNDERDRAIN CONSTRUCTION

Drain trenches shall be graded to maintain a minimum of .01ft/ft or 1% drop from beginning to outlet. The Outlet Headwalls shall be placed to blend in with the surrounding topography with the outlet tubing placed above the bottom of the drainage so as to permit proper flow from the outlet.

Care must be taken to ensure that the drains, membrane and outlet tubing are not damaged during construction. Sufficient cover material is to be placed over the drains before heavy equipment is allowed to work over the drains.

The drain locations and elevations given are based on the best information available to the Geotechnical Engineering Activity. The actual field conditions may require that adjustments be made by the Project Engineer to provide for sufficient drainage.

During underdrain installation the north ditch shall be leveled so that positive drainage is maintained.

| Table of Underdrain Quantities | | | | | | | | |
|--------------------------------|-------|--------------|-----|-----------------------------|--|---|--|--|
| Station | to | Station | L/R | Porous Backfill (Ton) | 4" Slotted Corrugated Polyethylene Drainage Tubing (Ft) | 4" Corrugated Polyethylene Drainage Tubing (Ft) | Impermeable Plastic Membrane (SqYd) | Precast Concrete Headwall for Drain (Each) |
| 2+00 | 10+80 | L | | 243 | 820 | 60 | | 1 |
| 8+40 | 11+00 | R | | 77 | 260 | 80 | | 1 |
| | 8+20 | Cutoff Drain | | 10 | 35 | 13 | 20 | 1 |
| | Total | | | 330 | 1115 | 153 | 20 | 2 |

TRAFFIC CONTROL – GENERAL NOTES

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 2 calendar days.

All regulatory signs shall have a minimum mounting height of 5' in rural locations, even when mounted on portable supports.

All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.

All construction operations shall be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.

Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

INVENTORY OF TRAFFIC CONTROL DEVICES

| | | CONVENTIONAL ROAD | | | |
|--------------|---------------------|--|-----------|---------------------|-------|
| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16.0 | 32.0 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16.0 | 32.0 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W21-5 | SHOULDER WORK | 2 | 48" x 48" | 16.0 | 32.0 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 4.5 | 9.0 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | 137.0 |

FENCE

Temporary Fence shall be placed at the perimeter of the work limits as directed by the Engineer.

| Table of Fencing | | | | | | | |
|------------------|----|---------|------------|-----------------|----------------|------------------------------|---------------------|
| | | | | Remove Fence | Reset Fence | Type 1 Temporary Fence | 2 Post Panels |
| Station | to | Station | Side (L/R) | (Ft) | (Ft) | (Ft) | (Each) |
| 5+65 | to | 11+90 | R | 735 | 735 | 920 | 2 |
| | | | Total | 735 | 735 | 920 | 2 |

REMOVE AND REPLACE TOPSOIL

Prior to beginning borrow operations, a 4” depth of topsoil from the borrow area shall be salvaged and stockpiled as directed by the Engineer. Following completion of borrow operations, topsoil shall be placed back on the borrow area as directed by the Engineer.

The estimated amount of topsoil to be removed and replaced is 477 CuYd.

All costs associated with removing and replacing the topsoil on borrow areas shall be incidental to the contract lump sum price for Remove and Replace Topsoil.

CONTRACTOR FURNISHED TOPSOIL

It is anticipated that a larger volume of topsoil will be needed for the slide area than can be salvaged from the existing grade. The Contractor will be required to furnish and place 4 inches of topsoil on the slide area and areas as determined by the Engineer during construction.

Contractor furnished topsoil shall be free from clay lumps, stones, coarse gravel, or similar objects larger than 1/2 inch in diameter. Brush, stumps, roots, wood, objectionable weeds, litter, or any other material which may be harmful to plant growth will not be allowed. Organic material shall be decomposed.

The estimated amount of Contractor Furnished Topsoil is 703 CuYd.

All costs to furnish and place the Contractor furnished topsoil shall be incidental to the contract unit price per cubic yard for “Contractor Furnished Topsoil”.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

| | |
|----------------------------|-----|
| <i>Glomus intraradices</i> | 25% |
| <i>Glomus aggregatu</i> | 25% |
| <i>Glomus mosseae</i> | 25% |
| <i>Glomus etunicatum</i> | 25% |

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture. The mycorrhizal inoculum shall be as shown below or an approved equal:

| Product | Manufacturer |
|-----------|--|
| MycoApply | Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com |

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer shall be applied at a rate of 1,500 pounds per acre in accordance with the manufacturer's recommended method of application.

The all-natural slow release fertilizer shall be as shown below or an approved equal:

| Product | Manufacturer |
|---------|--|
| Sustane | Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 www.sustane.com |

TYPE F PERMANENT SEED MIXTURE

The areas to be hydroseeded with Type F Permanent Seed Mixture shall comprise of all newly graded areas within the project limits.

Type F Permanent Seed Mixture shall consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|--|-----------------------------------|------------------------------------|
| Western Wheatgrass | Arriba, Flintlock, Rodan, Rosana | 7 |
| Green Needlegrass | Lodorm | 4 |
| Sideoats Grama | Butte, Killdeer, Pierre, Trailway | 3 |
| Blue Grama | Bad River, Willis | 2 |
| Oats or Spring Wheat: April through May; Winter Wheat: August through November | | 10 |
| Total: | | 26 |

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project to decompose.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

<http://sddot.com/business/certification/products/Default.aspx>

| Table of Erosion Control Items | | | | | | |
|--------------------------------|-------|---|-------------------|----------------------|---|---------------------------------|
| | Acres | Type F Permanent Seed Mixture (Lbs) | Mulching (Ton) | Fertilizing (Ton) | 12" Erosion Control Wattle (Ft) | Erosion Control Wattle Notes |
| Total | 3.2 | 83 | 3.2 | 2.40 | 930 | Perimeter |

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers right of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES*

SITE DESCRIPTION (4.2 1)

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
 - ☒ Clearing and grubbing
 - ☒ Excavation/borrow
 - ☒ Grading and shaping
 - ☐ Filling
 - ☒ Cutting and filling
 - ☐ Other (describe):
- **Total Project Area 3.2 ac (4.2 1.b.)**
- **Total Area To Be Disturbed 3.2 ac (4.2 1.b.)**
- **Existing Vegetative Cover 95(%)**
- **Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies Cheyenne River (4.2 1.e.)**

ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)

- (Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)
- **Install perimeter protection where runoff sheets from the site.**
 - **Clearing and grubbing.**
 - **Remove and store topsoil.**
 - **Stabilize disturbed areas.**
 - **Complete final grading.**
 - **Complete traffic control installation and protection devices.**
 - **Reseed areas disturbed by removal activities.**

EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))

- (Check all that apply)
- **Stabilization Practices (See Detail Plan Sheets)**
 - ☐ Temporary Seeding (Cover Crop Seeding)
 - ☒ Permanent Seeding
 - ☐ Sodding
 - ☐ Planting (Woody Vegetation for Soil Stabilization)
 - ☐ Mulching (Grass Hay or Straw)
 - ☐ Hydraulic Mulch (Wood Fiber Mulch)
 - ☐ Soil Stabilizer
 - ☐ Bonded Fiber Matrix
 - ☐ Erosion Control Blankets or Mats
 - ☐ Vegetation Buffer Strips
 - ☐ Roughened Surface (e.g. tracking)
 - ☐ Dust Control
 - ☐ Other:
 - **Structural Temporary Erosion and Sediment Controls**
 - ☐ Silt Fence
 - ☐ Floating Silt Curtain
 - ☐ Straw Bale Check
 - ☐ Temporary Berm
 - ☐ Temporary Slope Drain

- ☒ Straw Wattles or Rolls
- ☐ Turf Reinforcement Mat
- ☐ Rip Rap
- ☐ Gabions
- ☐ Rock Check Dams
- ☐ Sediment Traps/Basins
- ☐ Inlet Protection
- ☐ Outlet Protection
- ☐ Surface Inlet Protection (Area Drain)
- ☐ Curb Inlet Protection
- ☐ Stabilized Construction Entrances
- ☐ Entrance/Exit Equipment Tire Wash
- ☐ Interceptor Ditch
- ☐ Concrete Washout Facility
- ☐ Temporary Diversion Channel
- ☐ Work Platform
- ☐ Temporary Water Barrier
- ☐ Temporary Water Crossing
- ☐ Other:

➤ **Wetland Avoidance**

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

➤ **Storm Water Management (4.2 2.b., (1) and (2))**

Storm water management will be handled by temporary controls outlined in “EROSION AND SEDIMENT CONTROLS” above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.

➤ **Other Storm Water Controls (4.2 2.c., (1) and (2))**

- **Waste Disposal**

All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general Contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
- **Hazardous Waste**

All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the Contractor's on-site representative will be responsible for seeing that these practices are followed.
- **Sanitary Waste**

Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management Contractor or as required by any local regulations.

MAINTENANCE AND INSPECTION (4.2 3. and 4.2 4.)

- **Maintenance and Inspection Practices**
 - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
 - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
 - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches ¹/₃ of the height of the silt fence.
 - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
 - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
 - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
 - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
 - The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance, repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

NON-STORM WATER DISCHARGES (3.0)

- The following non-storm water discharges are anticipated during the course of this project (check all that apply).
- ☐ Discharges from water line flushing.
 - ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
 - ☐ Uncontaminated ground water associated with dewatering activities.

MATERIALS INVENTORY (4.2. 2.c.(2))

- The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings “EROSION AND SEDIMENT CONTROLS” and “SPILL PREVENTION” (check all that apply).
- ☐ Concrete and Portland Cement
 - ☐ Detergents
 - ☐ Paints
 - ☐ Metals
 - ☒ Bituminous Materials
 - ☒ Petroleum Based Products
 - ☐ Cleaning Solvents
 - ☐ Wood
 - ☐ Cure
 - ☐ Texture
 - ☐ Chemical Fertilizers
 - ☐ Other:

SPILL PREVENTION (4.2 2.c.(2))

➤ Material Management

- Housekeeping
 - Only needed products will be stored on-site by the Contractor.
 - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
 - Products must be stored in original containers and labeled.
 - Material mixing will be conducted in accordance with the manufacturer's recommendations.
 - When possible, all products will be completely used before properly disposing of the container off-site.
 - The manufacturer's directions for disposal of materials and containers will be followed.
 - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
 - Dust generated will be controlled in an environmentally safe manner.
 - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.
- Hazardous Materials
 - Products will be kept in original containers unless the container is not resealable.
 - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
 - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
 - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
 - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
 - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

➤ Product Specific Practices (6.8)

- Petroleum Products

All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- Fertilizers

Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

- Paints

All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
- Concrete Trucks

Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any storm water outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

➤ Spill Control Practices (4.2 2 c.(2))

- In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.
- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
 - Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
 - All spills will be cleaned immediately after discovery and the materials disposed of properly.
 - The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
 - After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
 - The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The Contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

➤ Spill Response (4.2 2 c.(2))

- The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.
- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
 - If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
 - Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.

- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR.
- Personnel with primary responsibility for spill response and clean up will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DENR immediately **if any one of the following** conditions exists:
 - The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
 - The discharge causes an immediate danger to human health or safety.
 - The discharge exceeds 25 gallons.
 - The discharge causes a sheen on surface water.
 - The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:51:01.
 - The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
 - The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
 - The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

To report a release or spill, call DENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at 605-773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the responsible person must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

CONSTRUCTION CHANGES (4.4)

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

CERTIFICATIONS

➤ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➤ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Authorized Signature (See the General Permit, Section 6.9.1.C.)

➤ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature

CONTACT INFORMATION

➤ **Contractor Information:**

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **SD DENR Contact Spill Reporting**

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➤ **SD DENR Contact for Hazardous Materials.**

- (605) 773-3153

➤ **National Response Center Hotline**

- (800) 424-8802.

Plot Scale - 1:100

Plotted From - lrrc12608

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 044-452 | 9 | 56 |

Plotting Date: 08/11/2016

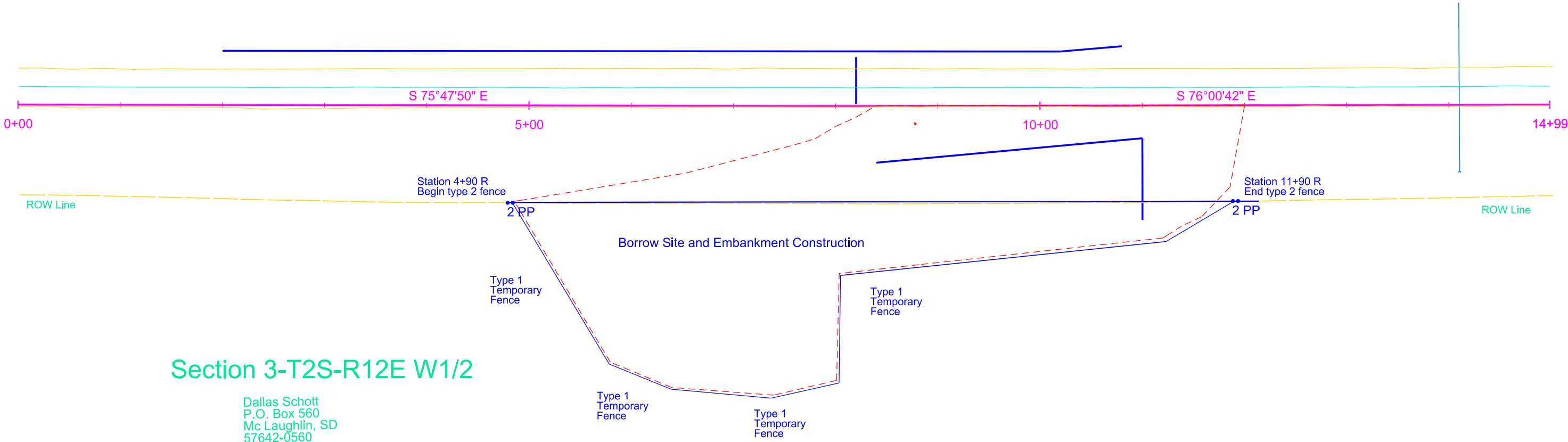


Section 3-T2S-R12E W1/2

Install Underdrain
Station 2+00 to Station 10+20
53' L
Install 4" Slotted Corrugated Polyethylene Drainage Tubing
Station 10+20 to Station 10+80
53' L to 58' L
Install 4" Corrugated Polyethylene Drainage Tubing
and headwall outlet

Station 8+20
2' L to 48' L
Install Cutoff Drain
and headwall outlet

Install Underdrain
Station 8+40 to Station 11+00
55' R to 32' R
Install 4" Slotted Corrugated Polyethylene Drainage Tubing
Station 11+00
32' L to 112' R
Install 4" Corrugated Polyethylene Drainage Tubing
and headwall outlet



Section 3-T2S-R12E W1/2

Dallas Schott
P.O. Box 560
Mc Laughlin, SD
57642-0560

POB
0+00.00
580771.176 N
1351149.733 E

PI 8+43.32
N 580564.264
E 1351967.27
Del 00°12'52" L
Dc 05°37'42"
T 1.91
L 3.81
R 1018.0

POE
14+98.89
580405.797 N
1352603.4 E

TYPICAL UNDERDRAIN INSTALLATION

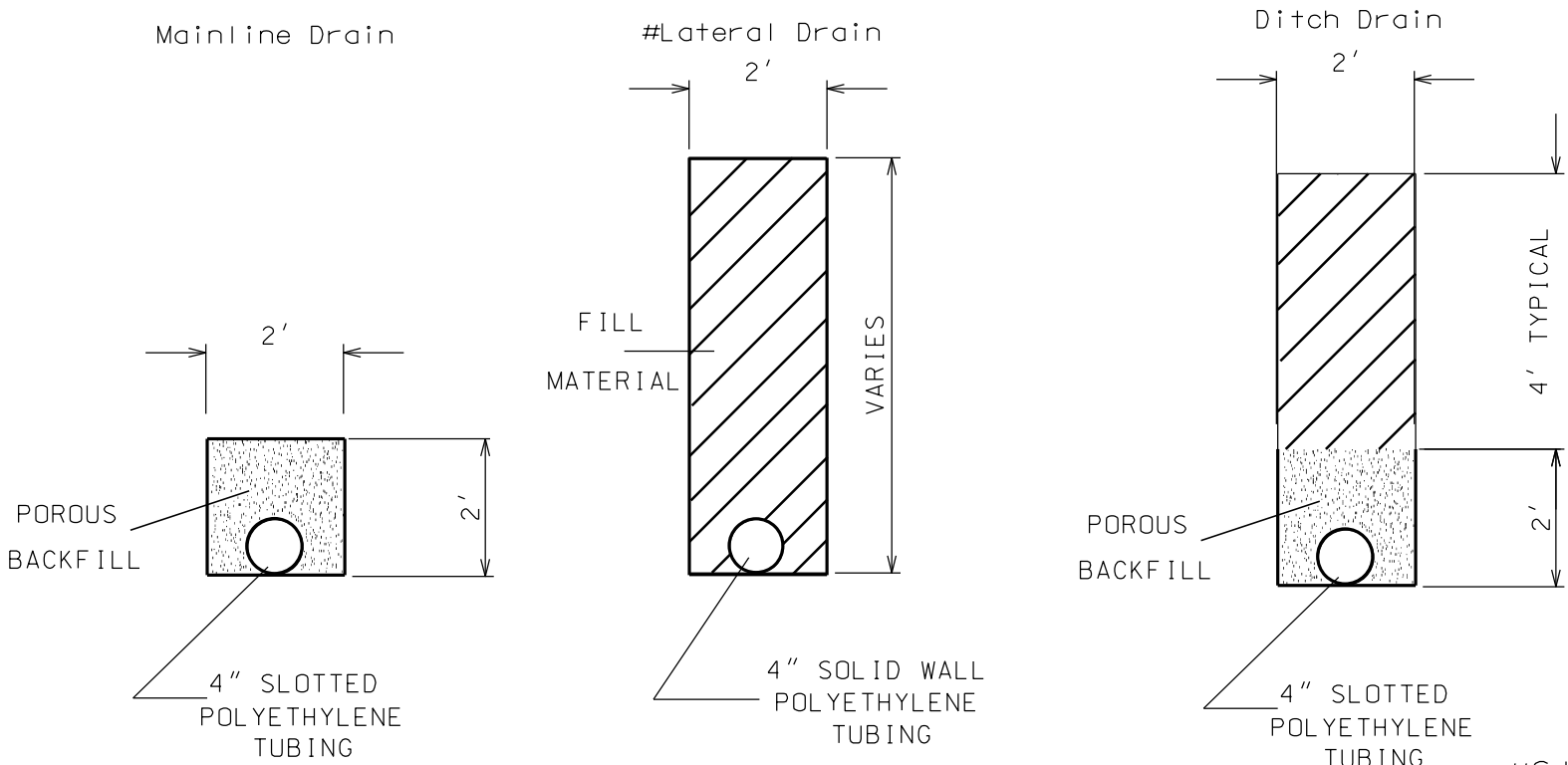
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| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 044-452 | 10 | 56 |

Plotting Date: 08/11/2016

Mainline Drain
Station 6+40 55' Rt. to Station 11+00 32' Rt.

Lateral Drains
Station 11+00 32' Rt. to Station 11+00 57'' Rt.

Ditch Drain
Station 2+00 53' Lt. to 10+80 58' Lt.



UNDERDRAINS SHALL BE CONSTRUCTED IN
ACCORDANCE WITH SECTION 680, OF THE STANDARD SPECIFICATIONS

#Station 10+20 to Station 10+80
53' L to 58' L
use Lateral Drain section

1:9.11144

Plot Scale -

trrc12608

trrc12608

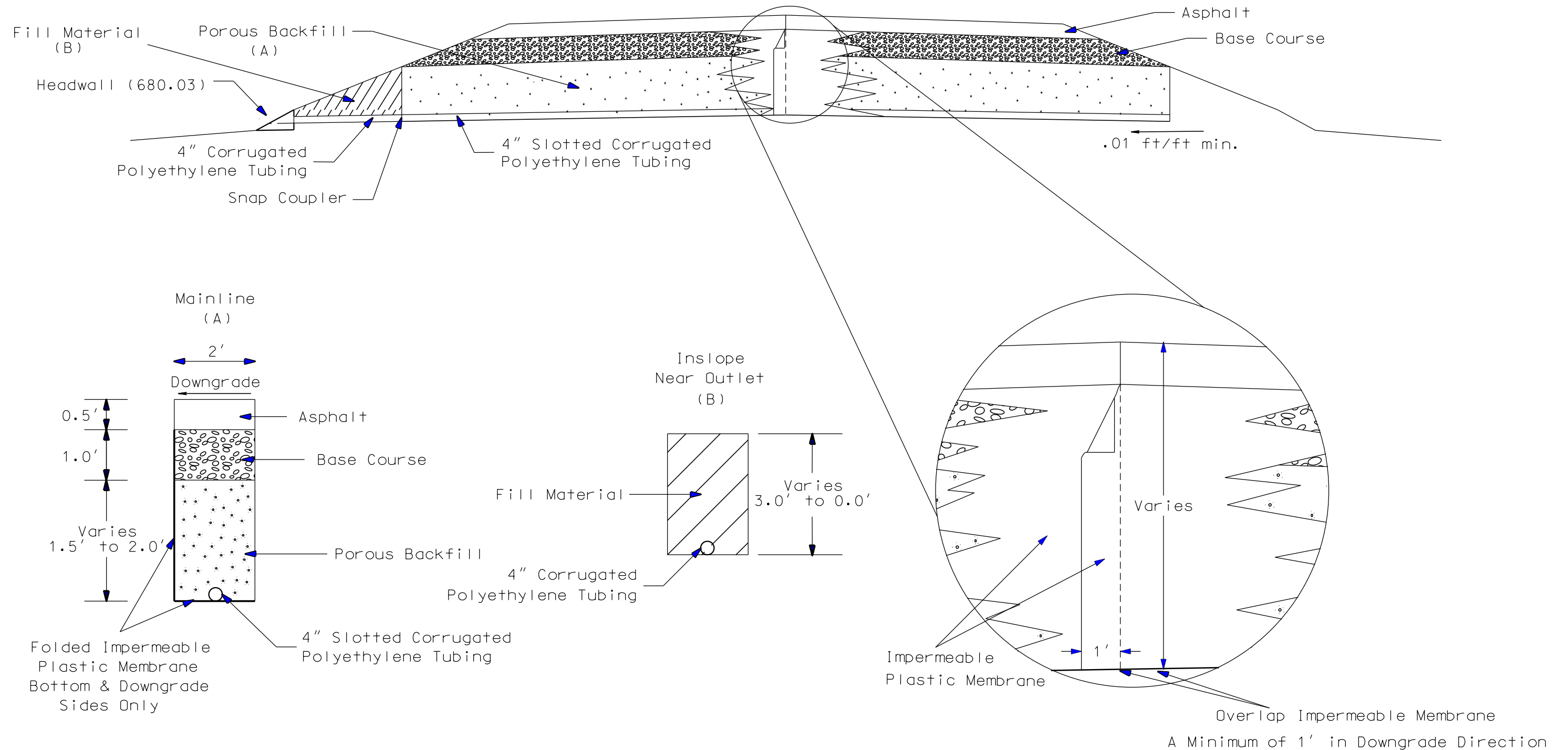
Plotted From -

Plotted From -

File - ...underdrain.dgn

Typical Cutoff Drain Installation

Station 8+20 2' Lt. to 48' Lt.

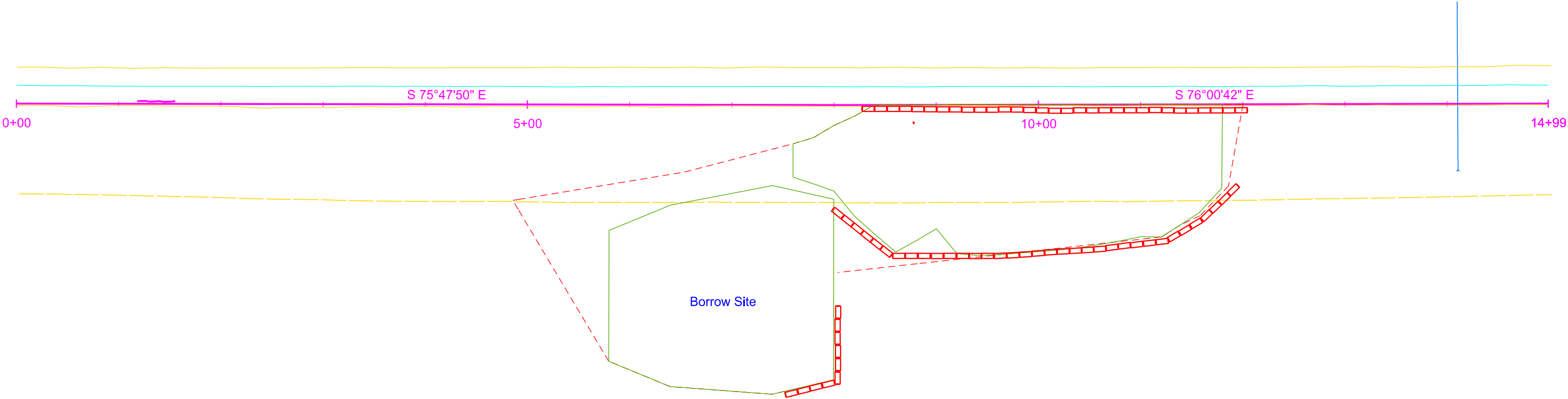


EROSION CONTROL

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 044-452 | 12 | 56 |

Plotting Date: 08/11/2016

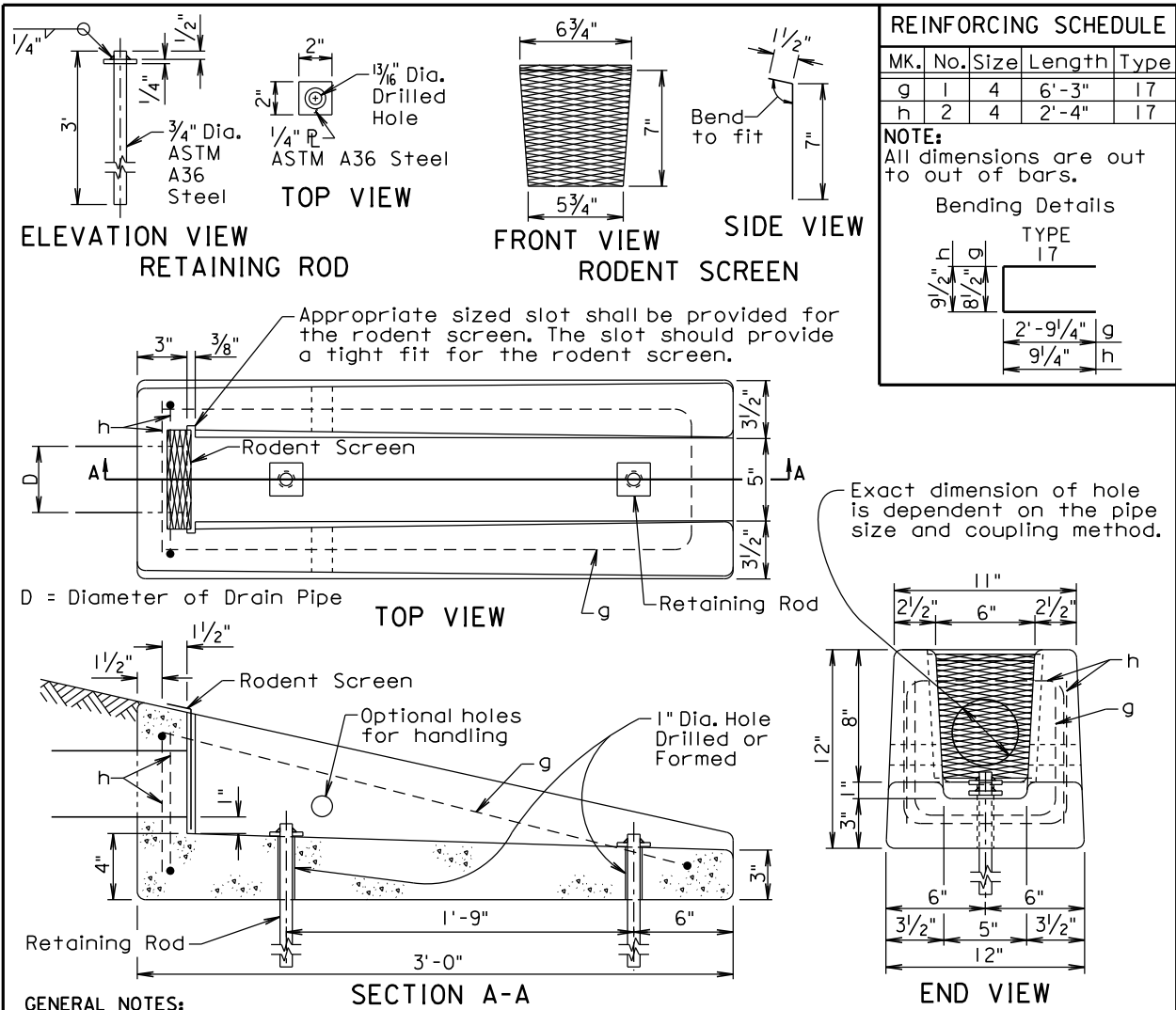
Plot Scale - 1:100



12" Erosion Control Wattle
8+30 0' R to 12+00 0' R 370 Ft
7+40 280' R to 8+00 200' R 130 Ft
8+00 100' R to 11+85 112' R 430 Ft

 12" Erosion Control Wattle

Plotted From - trc12608



Published Date: 3rd Qtr. 2016

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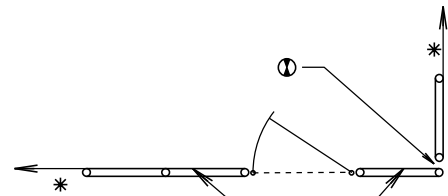
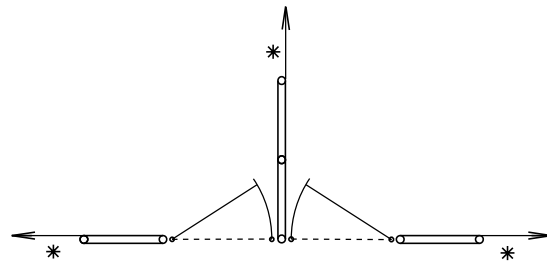
**PRECAST CONCRETE HEADWALL
FOR DRAIN**

**PLATE NUMBER
430.50**

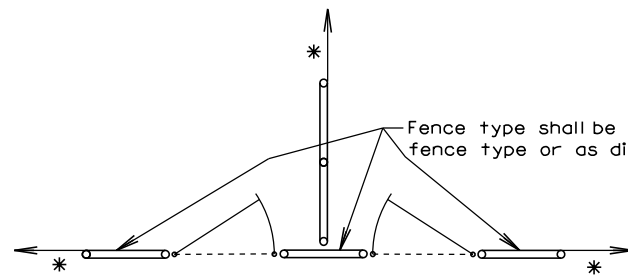
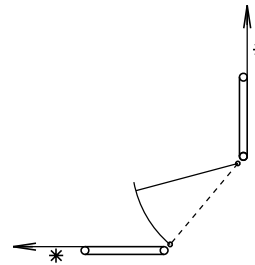
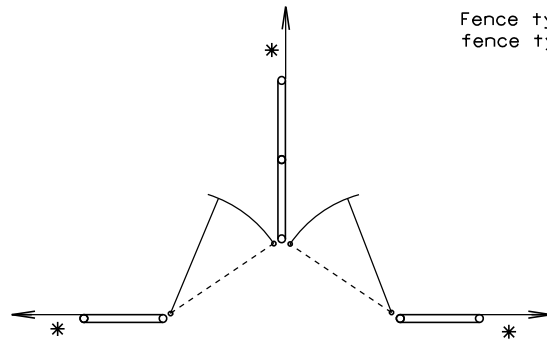
Sheet 1 of 1



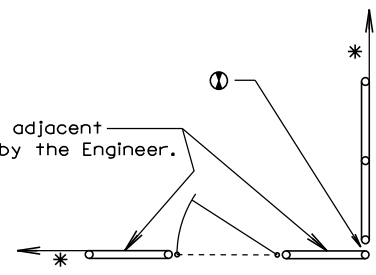
ENTRANCE
(NOT ON CORNER)



Fence type shall be same as adjacent
fence type or as directed by the Engineer.



DOUBLE ENTRANCES



ENTRANCES AT CORNERS

GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

December 23, 2004

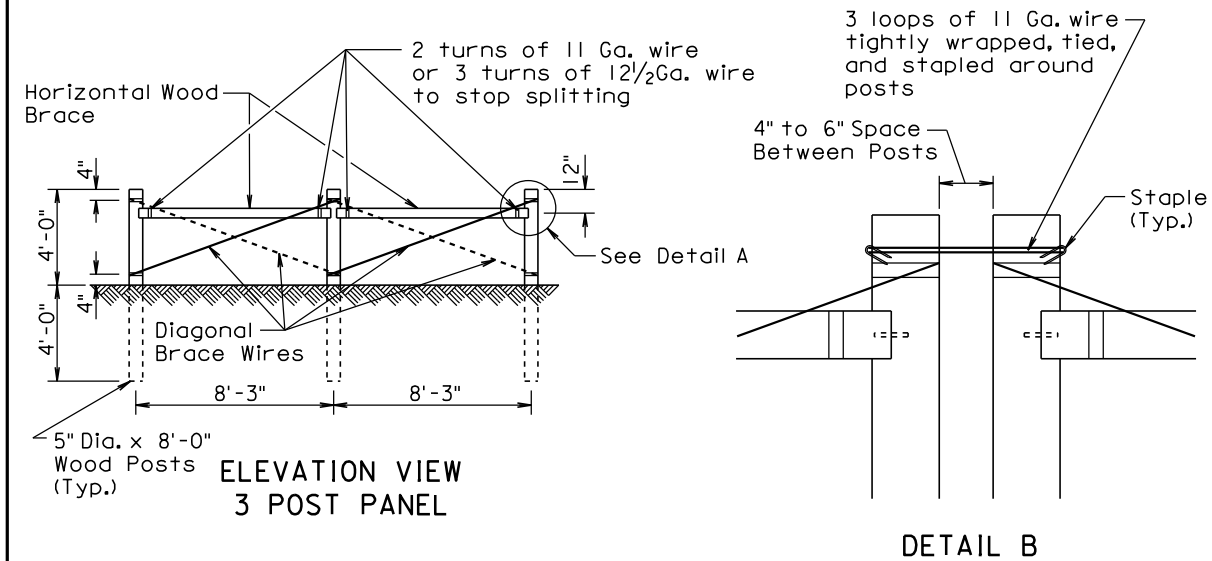
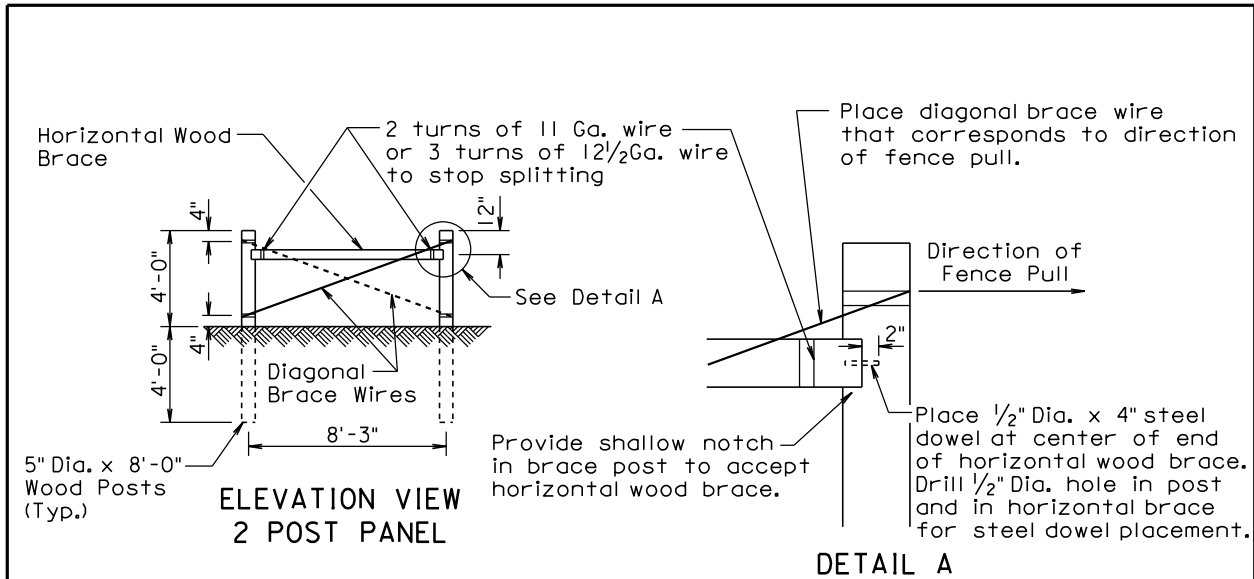
Published Date: 3rd Qtr. 2016

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**BRACE PANELS
AND APPLICATIONS OF BRACE PANELS**

PLATE NUMBER
620.03

Sheet 3 of 3



GENERAL NOTES:

- Two Post Panels shall be installed at least every 1320' between corners.
- Two Post Panels shall be installed at any sharp vertical angle crest points and as directed by the Engineer.
- Horizontal wood braces shall consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.
- Diagonal brace wires shall be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires shall be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

December 23, 2004

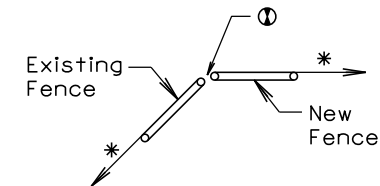
| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | BRACE PANELS AND APPLICATIONS OF BRACE PANELS | PLATE NUMBER 620.03 |
| | | | Sheet 1 of 3 |

| SPACING OF 2 POST PANELS WITHIN CURVES | |
|--|---|
| DEGREE OF CURVE | SPACING OF 2 POST PANEL |
| less than 3°15' | ** 1320' |
| 3°15' and greater | **At P.C., P.T., and at every 1320' between P.C. and P.T. |

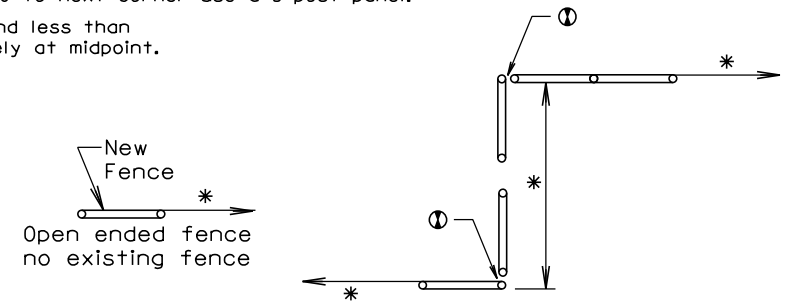
GENERAL NOTE:

All degrees of curvature stated for fence are at centerline of roadway.

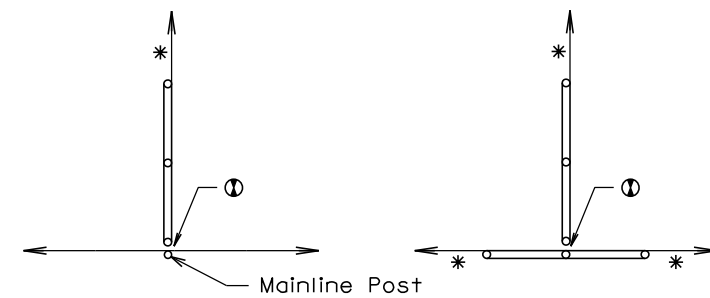
- * If fence length is less than 600' to next corner use a 2 post panel.
- * If fence length is greater than 600' to next corner use a 3 post panel.
- ** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.
- ① See Detail B on Sheet 1 of 3.



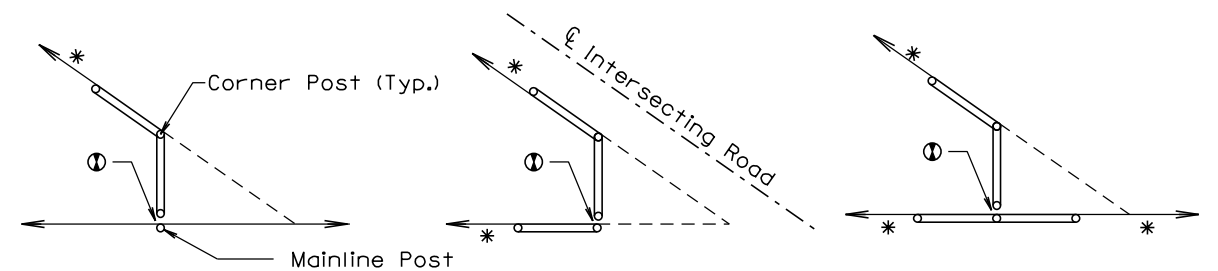
BEGIN OR END FENCE
(where new fence ties into existing fence)



SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

December 23, 2004

| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | BRACE PANELS AND APPLICATIONS OF BRACE PANELS | PLATE NUMBER 620.03 |
| | | | Sheet 2 of 3 |

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) |
|-------------------------------------|---|
| 0 - 30 | 200 |
| 35 - 40 | 350 |
| 45 - 50 | 500 |
| 55 | 750 |
| 60 - 80 | 1000 |



April 15, 2015

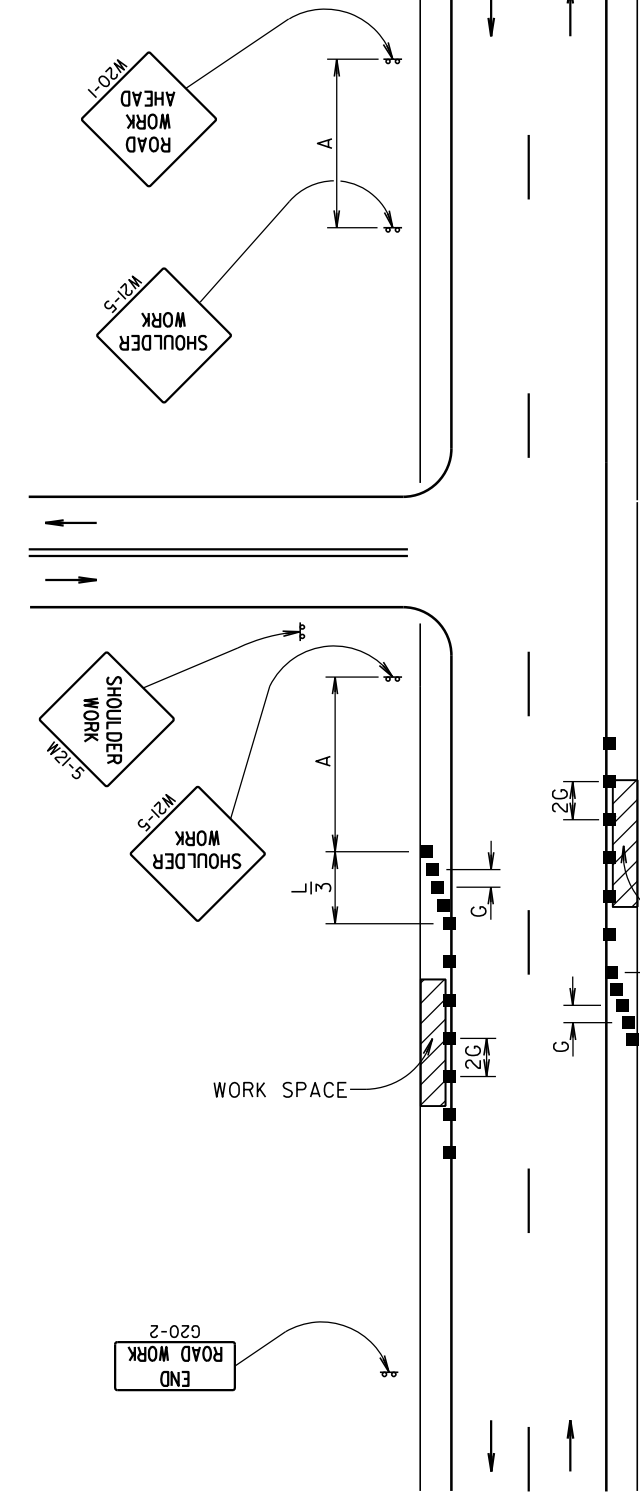
Published Date: 3rd Qtr. 2016

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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

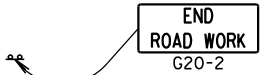
PLATE NUMBER
634.01

Sheet 1 Of 1



| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|-------------------------------------|---|-------------------------|--|
| 0 - 30 | 200 | 180 | 25 |
| 35 - 40 | 350 | 320 | 25 |
| 45 | 500 | 600 | 25 |
| 50 | 500 | 600 | 50 |
| 55 | 750 | 660 | 50 |
| 60 - 65 | 1000 | 780 | 50 |

Channelizing Device



The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

WORK SPACE



June 3, 2016

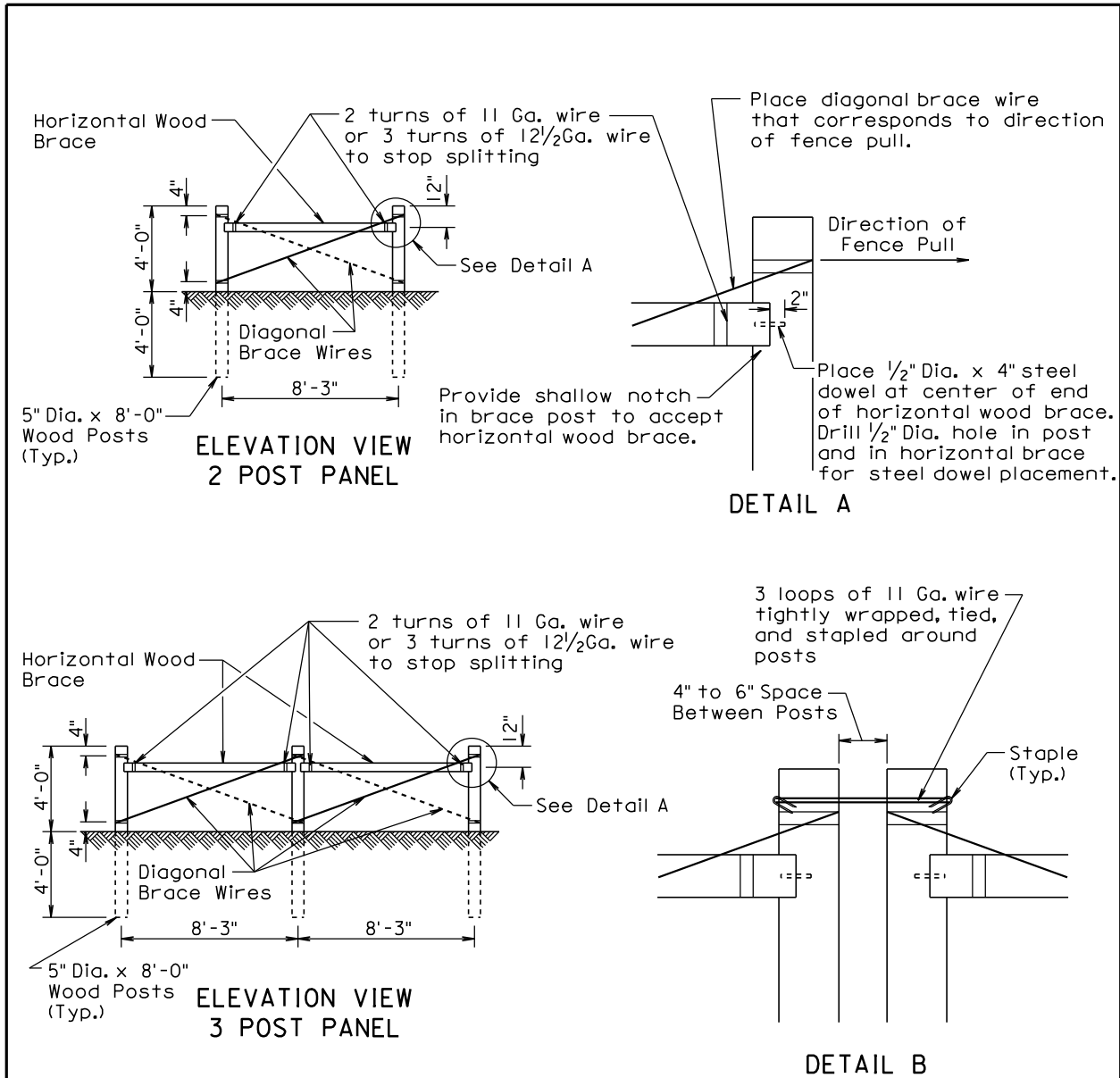
Published Date: 3rd Qtr. 2016

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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER
634.03

Sheet 1 of 1

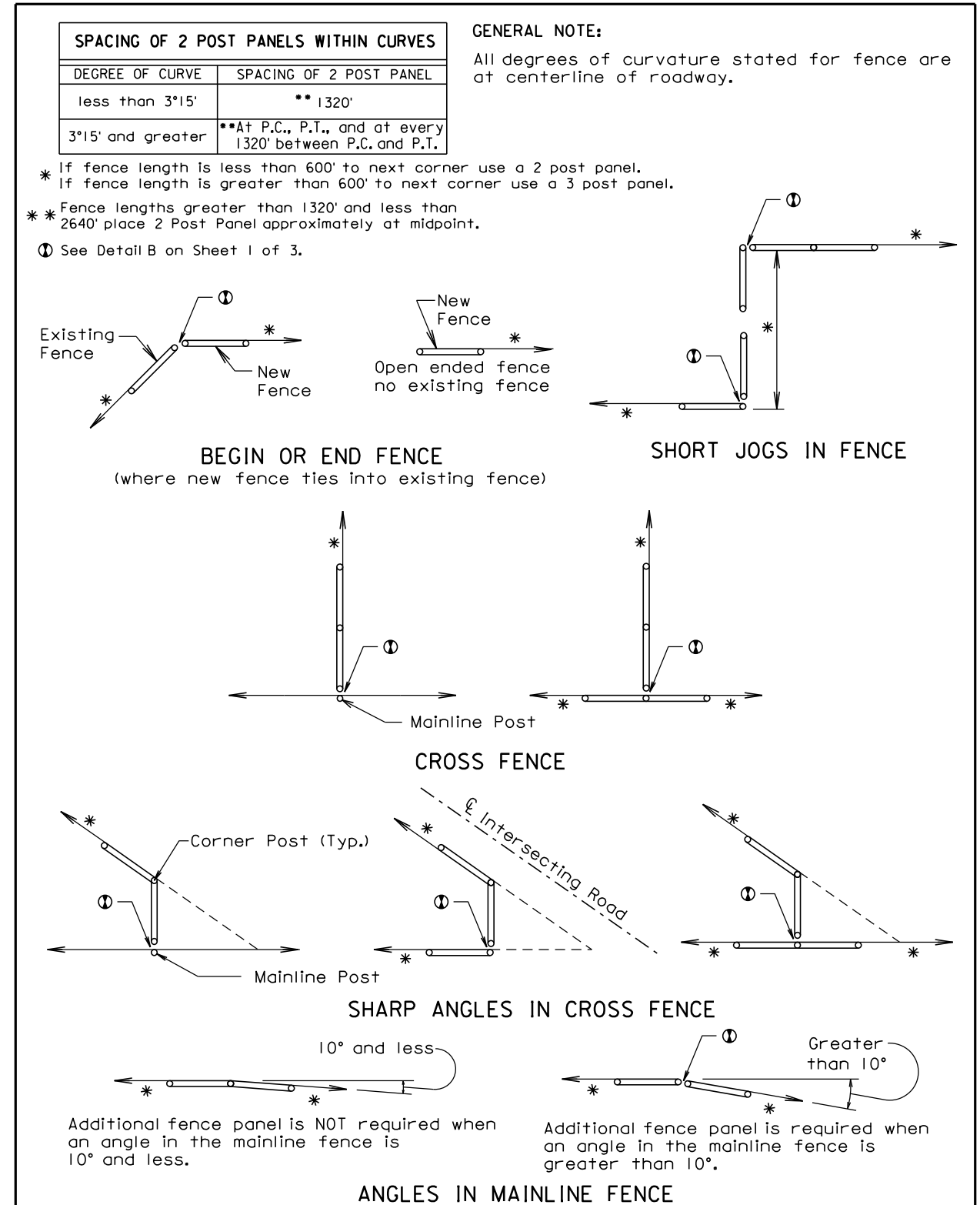


GENERAL NOTES:

- Two Post Panels shall be installed at least every 1320' between corners.
- Two Post Panels shall be installed at any sharp vertical angle crest points and as directed by the Engineer.
- Horizontal wood braces shall consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.
- Diagonal brace wires shall be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires shall be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

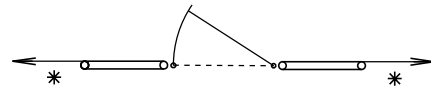
December 23, 2004

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| Published Date: 3rd Qtr. 2016 | S D D O T | BRACE PANELS AND APPLICATIONS OF BRACE PANELS | PLATE NUMBER 620.03 |
| | | | Sheet 1 of 3 |

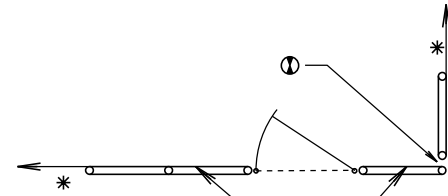
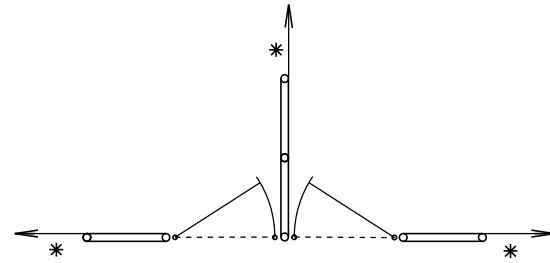


December 23, 2004

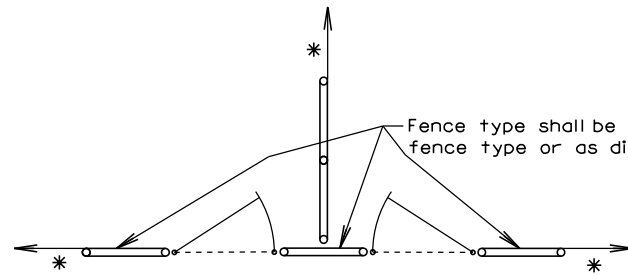
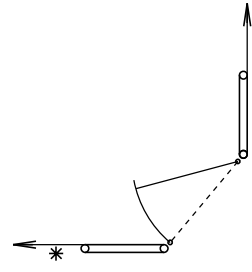
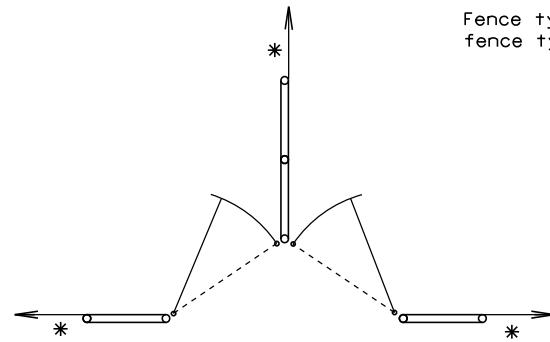
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| | | | Sheet 2 of 3 |



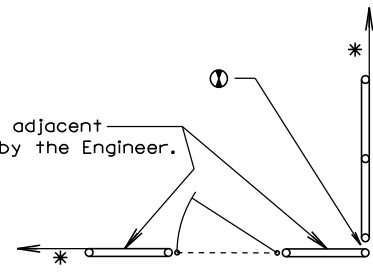
ENTRANCE
(NOT ON CORNER)



Fence type shall be same as adjacent
fence type or as directed by the Engineer.



DOUBLE ENTRANCES



ENTRANCES AT CORNERS

GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

December 23, 2004

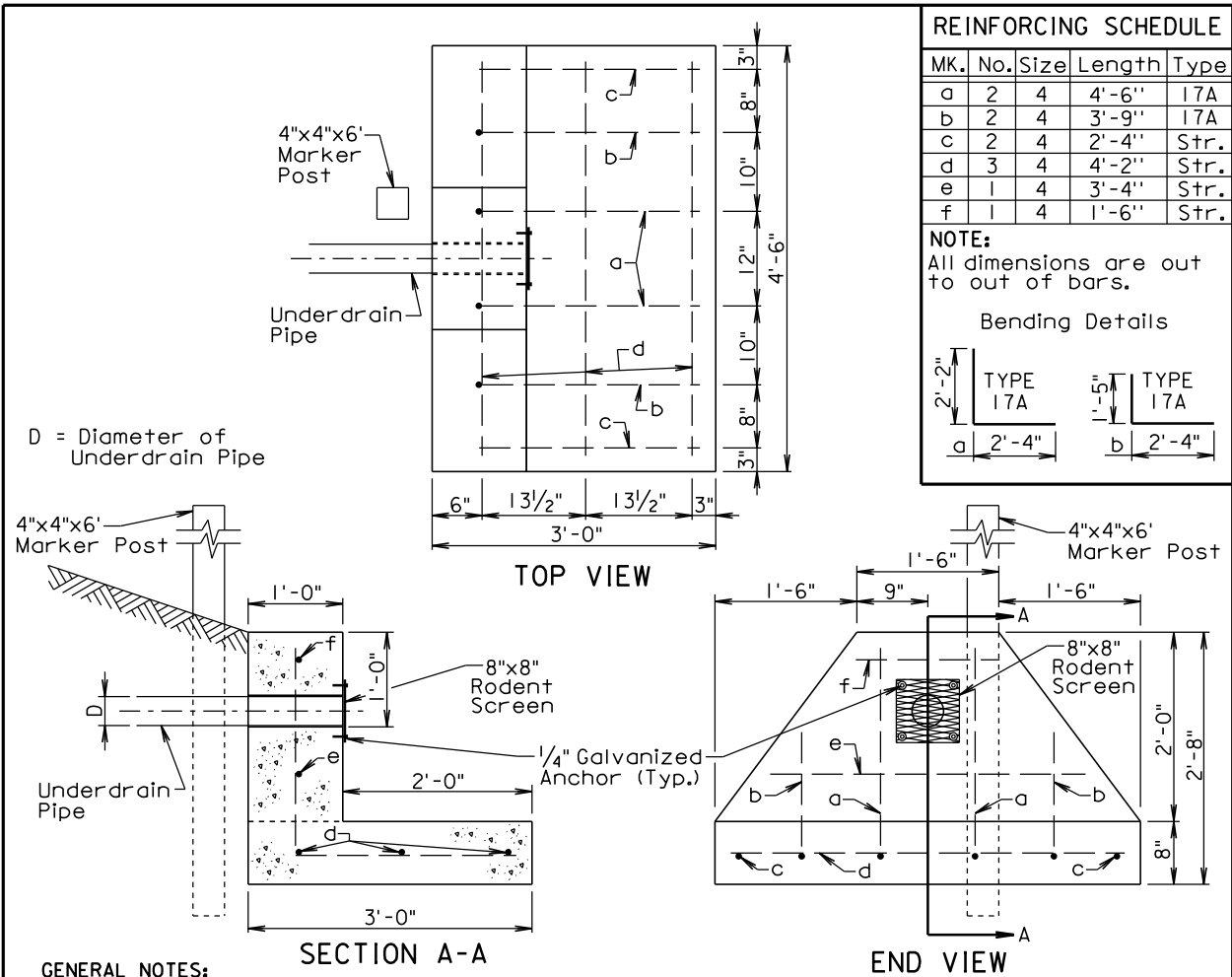
Published Date: 3rd Qtr. 2016

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**BRACE PANELS
AND APPLICATIONS OF BRACE PANELS**

**PLATE NUMBER
620.03**

Sheet 3 of 3



GENERAL NOTES:

The concrete shall be Class M6. The concrete shall conform to the requirements of Section 462 of the Specifications except the minimum curing time shall be 72 hours. It is estimated that 0.55 cubic yards of concrete is required for each unit.

Four cast-in-place or drilled-in 1/4" galvanized anchors shall be placed in the headwall. Each galvanized anchor shall be placed approximately 1" from the outside corner of the rodent screen. It is preferred that the anchor location be centered at an opening in the rodent screen.

All reinforcing steel shall conform to ASTM A615 Grade 60. It is estimated that 25.7 pounds of reinforcing steel is required for each unit.

The underdrain pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The 8"x8" rodent screen shall be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size shall be 1/2". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires. The rodent screen shall be centered about the hole in the headwall and fastened to the headwall with the appropriate bolts or nuts with washers.

A 4"x4"x6' marker post shall be placed at the approximate location as depicted in the above drawings for each concrete headwall. The marker post shall project 3'± above the ground line. The marker post shall be cedar or treated with a wood preservative and shall be painted with two coats of white paint.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, rodent screen, anchors, and marker post shall be incidental to the contract unit price per each for "Concrete Headwall for Underdrain".

June 26, 2015

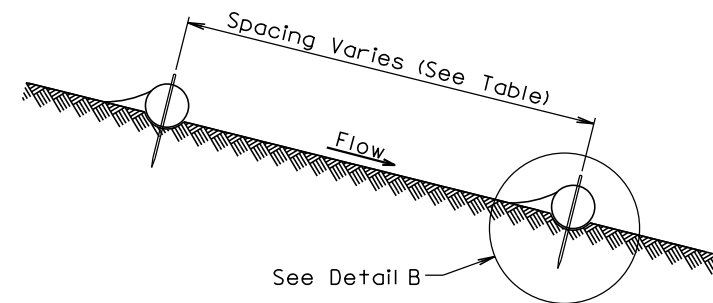
Published Date: 3rd Qtr. 2016

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CONCRETE HEADWALL FOR UNDERDRAIN

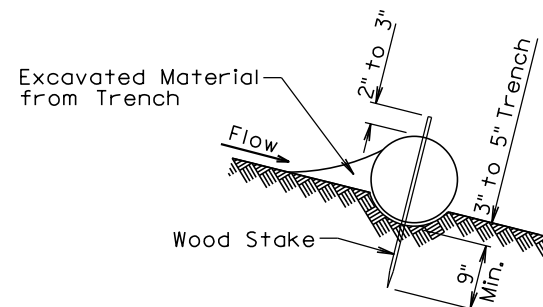
PLATE NUMBER
680.01

Sheet 1 of 1

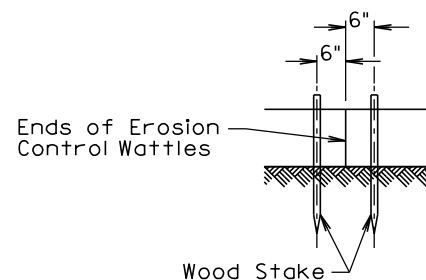


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

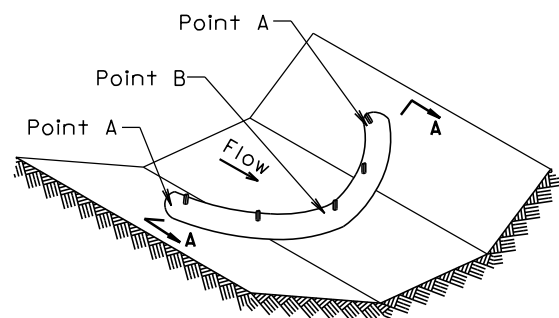
| CUT OR FILL SLOPE INSTALLATION | |
|-----------------------------------|-----------------|
| Slope | Spacing (Ft) |
| 1:1 | 10 |
| 2:1 | 20 |
| 3:1 | 30 |
| 4:1 | 40 |



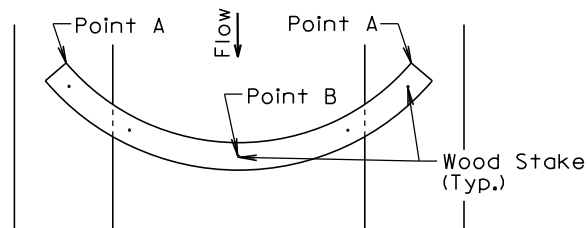
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

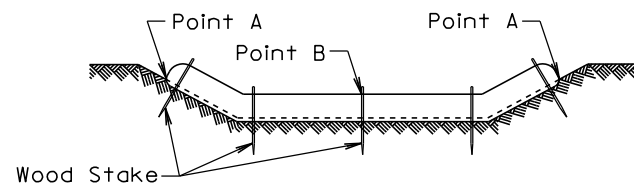


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

| DITCH INSTALLATION | |
|--------------------|-----------------|
| Grade | Spacing (Ft) |
| 2% | 150 |
| 3% | 100 |
| 4% | 75 |
| 5% | 50 |



SECTION A-A

December 23, 2004

| | | | |
|-------------------------------|-----------------------|------------------------|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | | Sheet 1 of 2 |

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

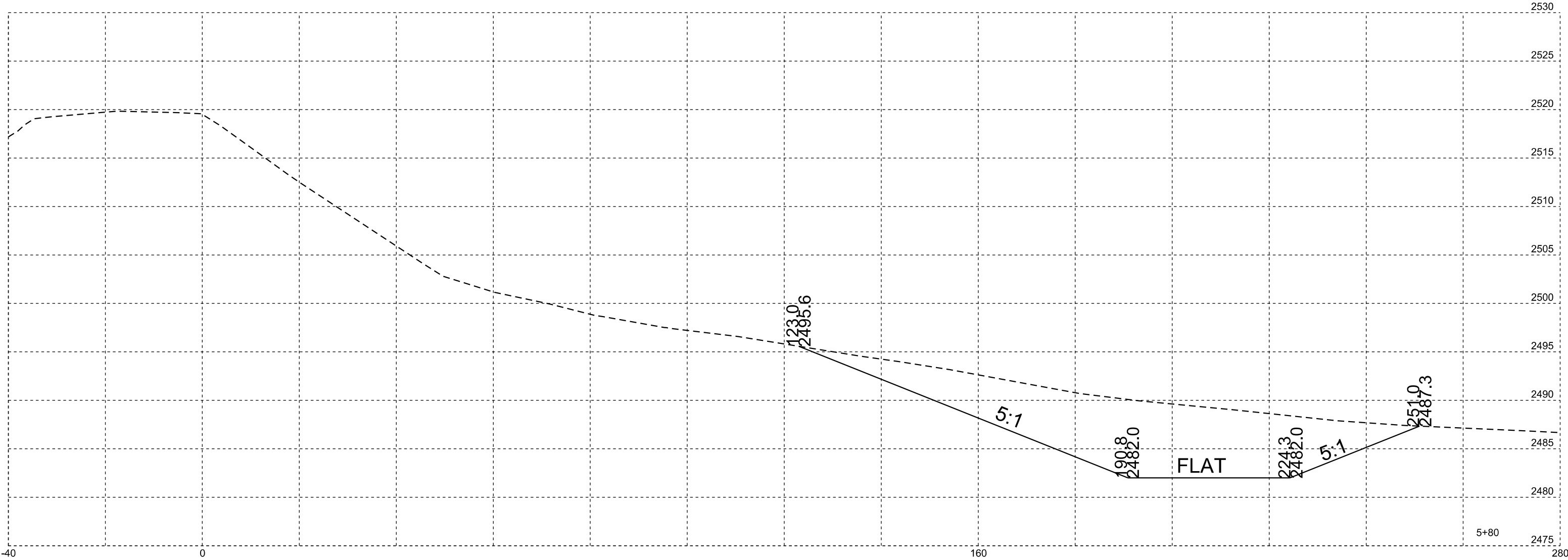
All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

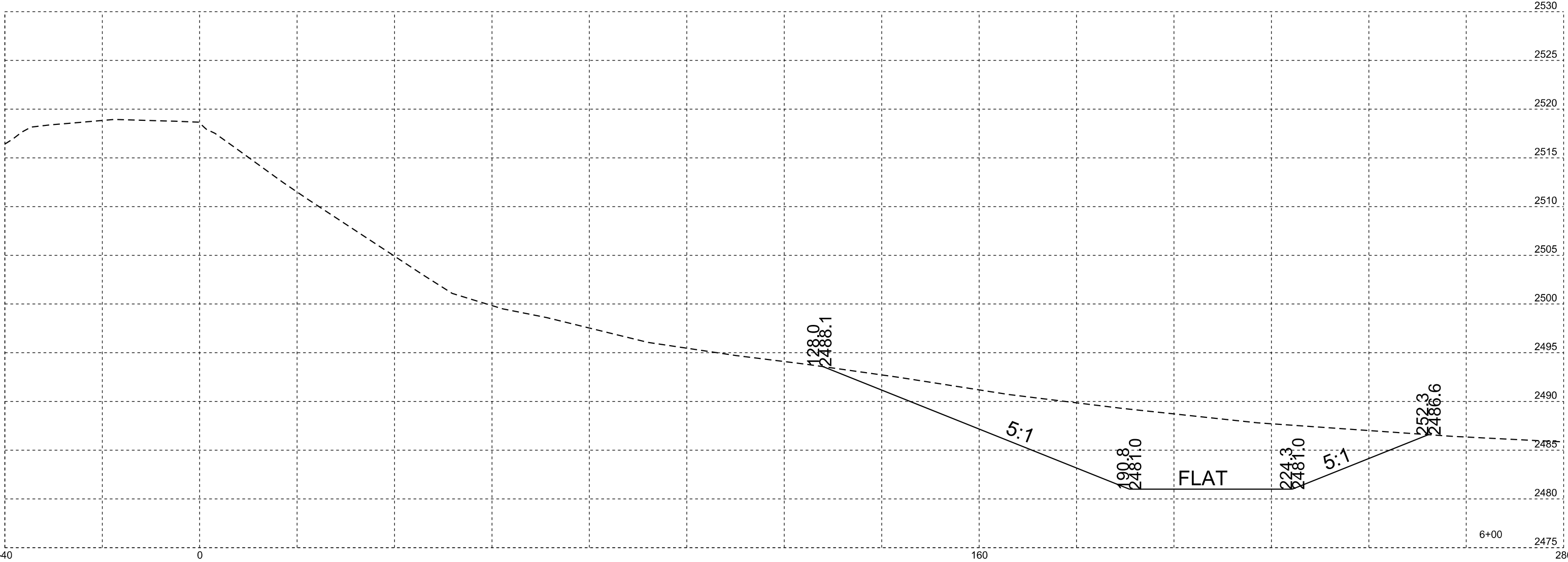
December 23, 2004

| | | | |
|-------------------------------|-----------------------|------------------------|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | | Sheet 2 of 2 |

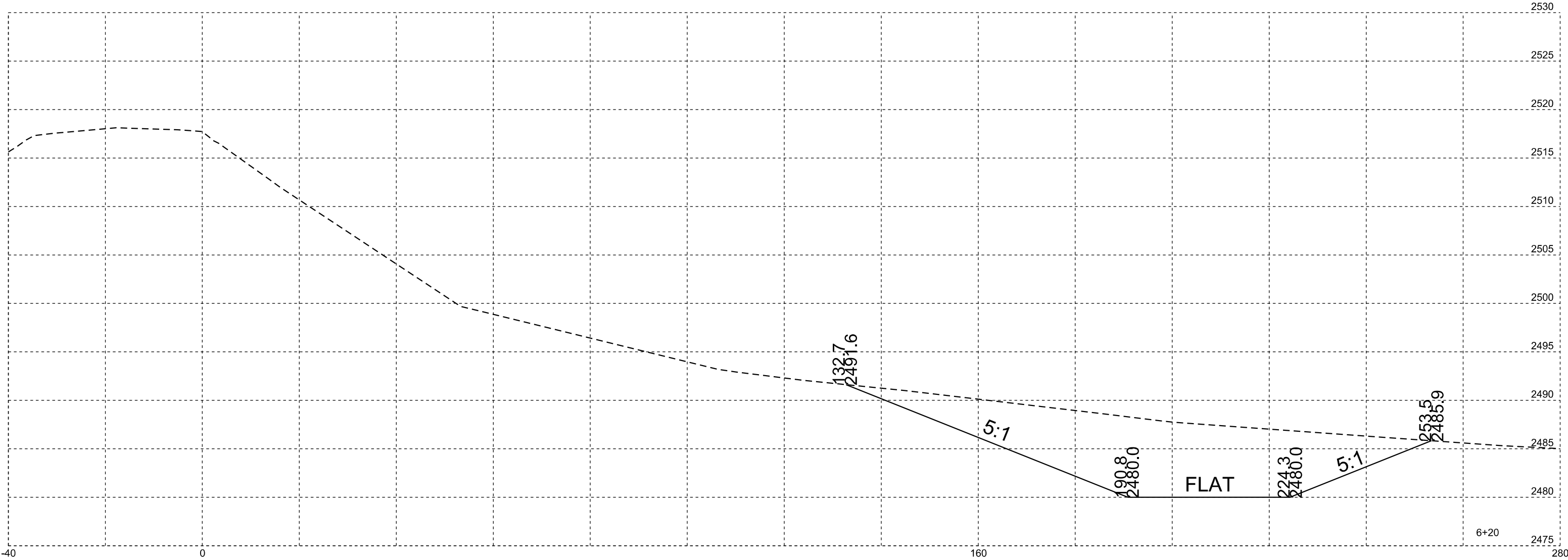
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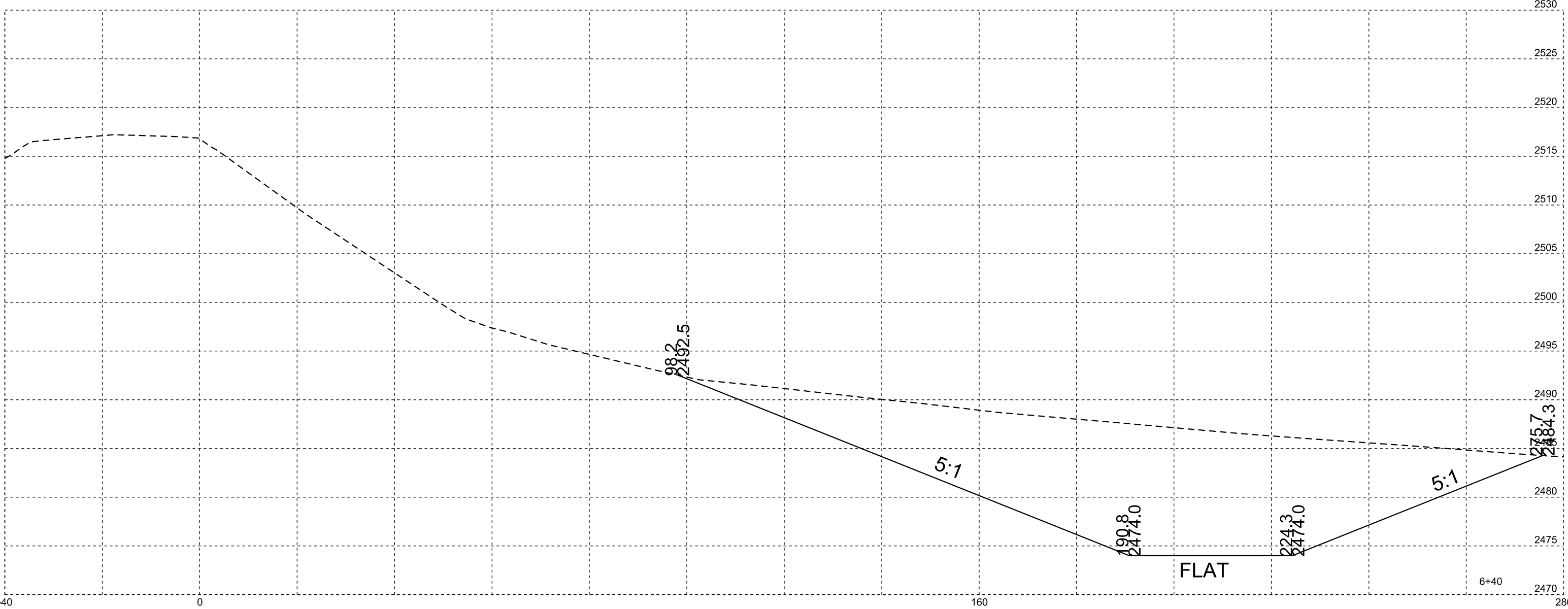
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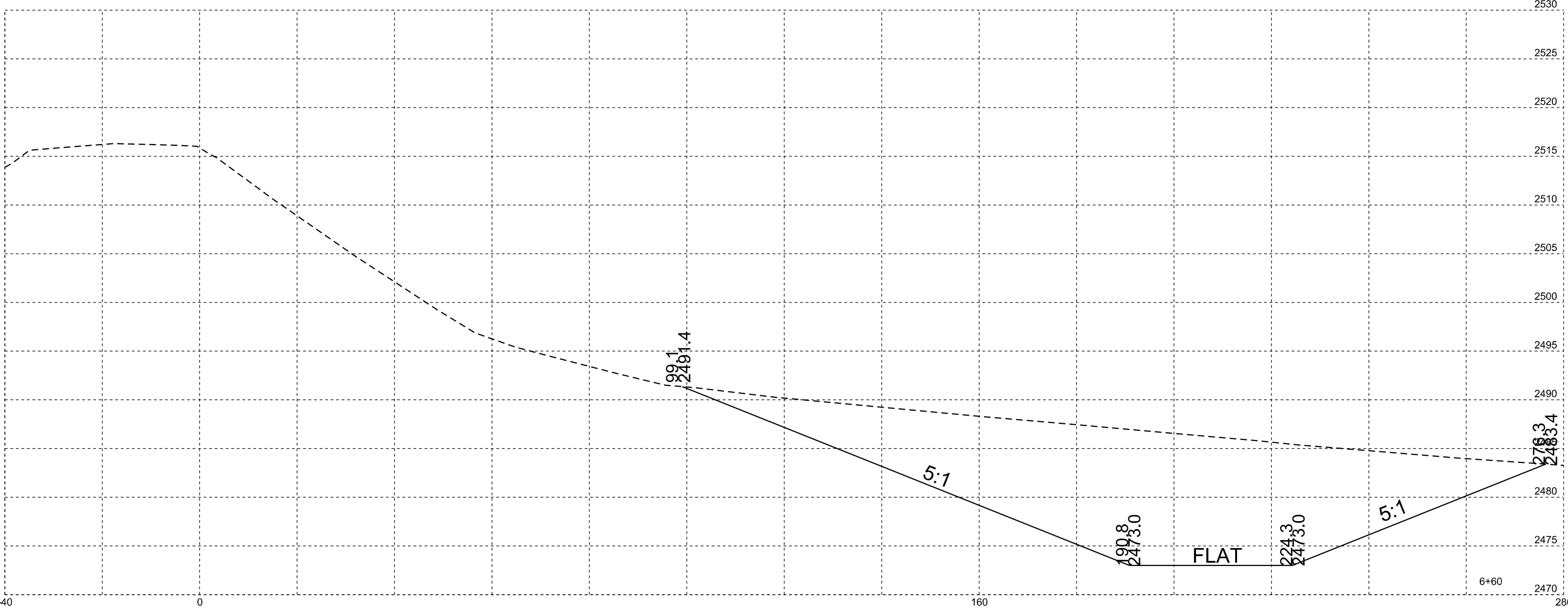
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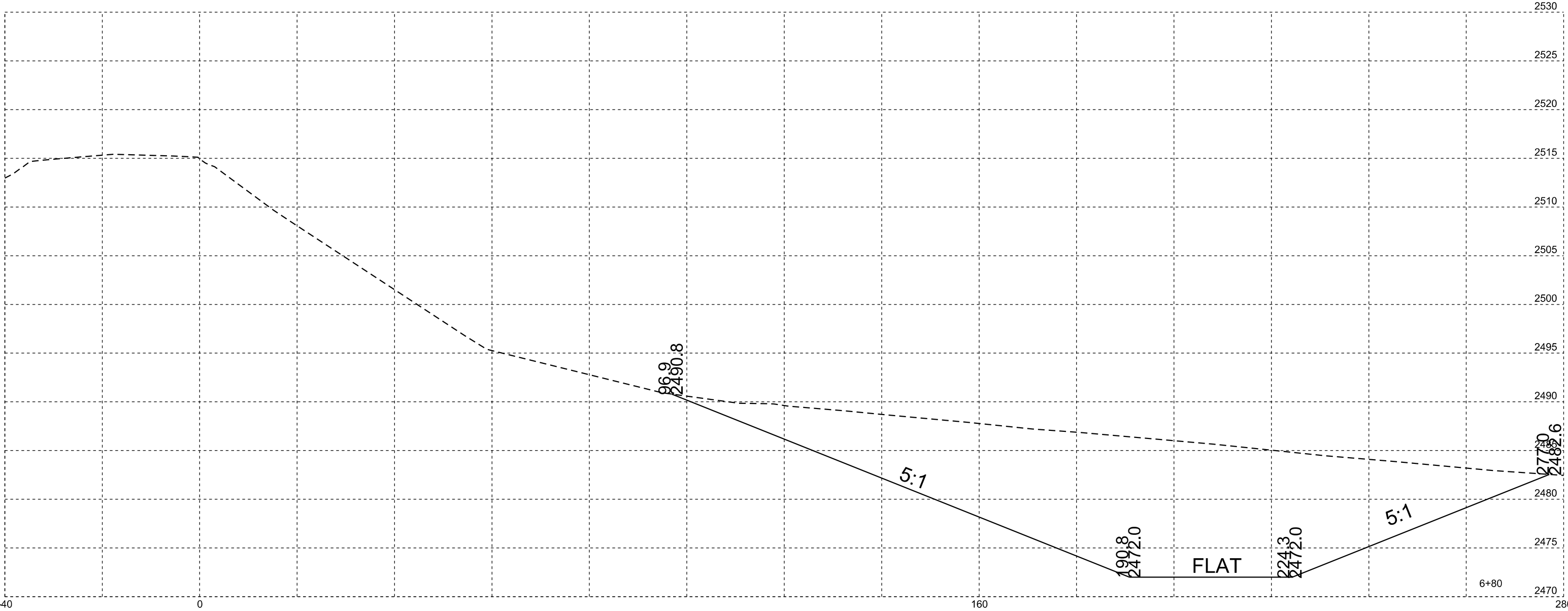
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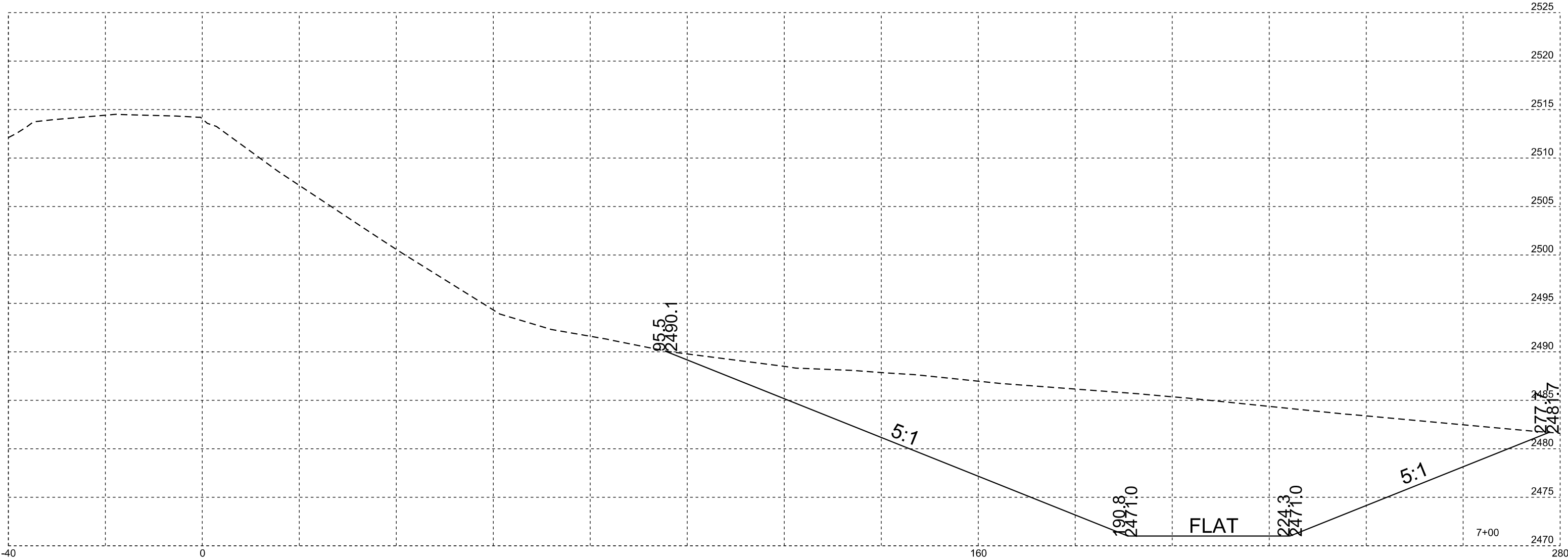
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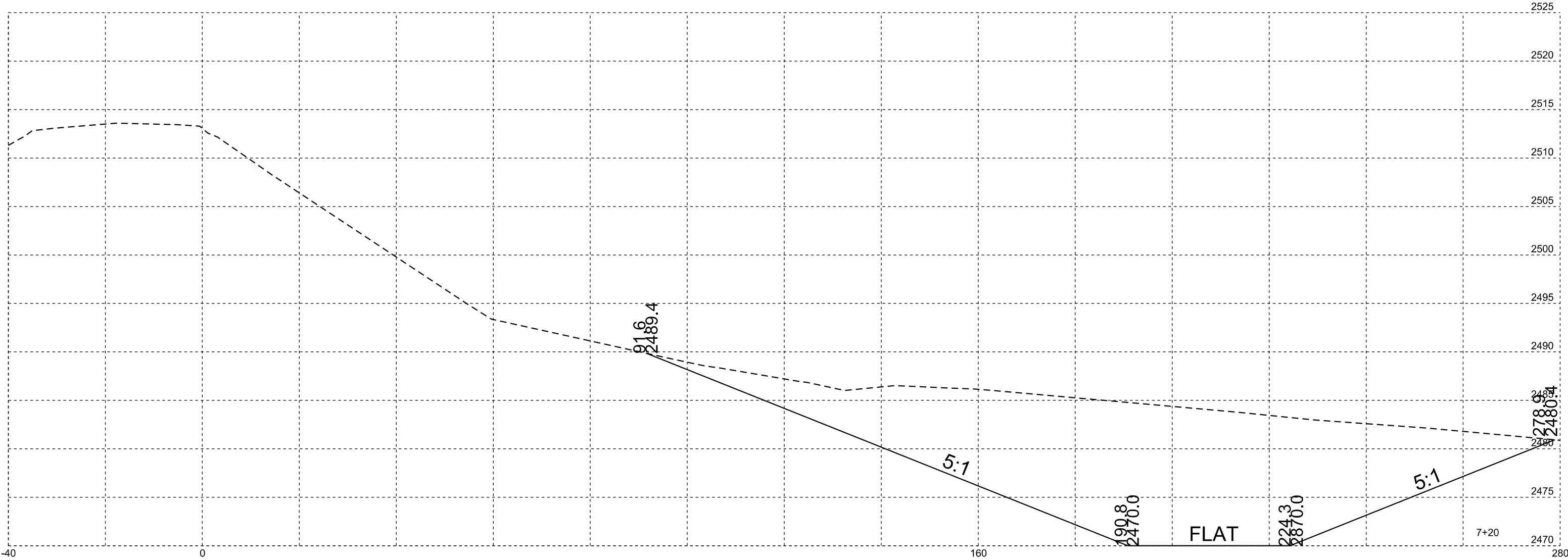
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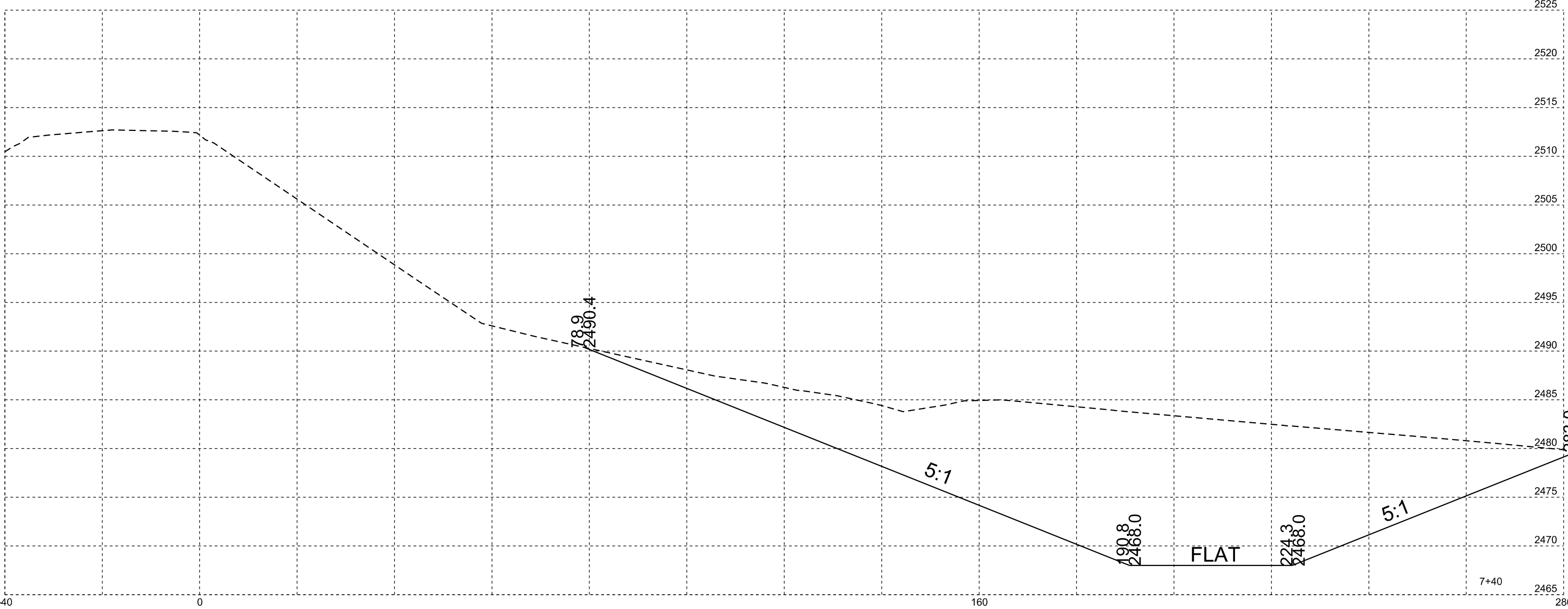
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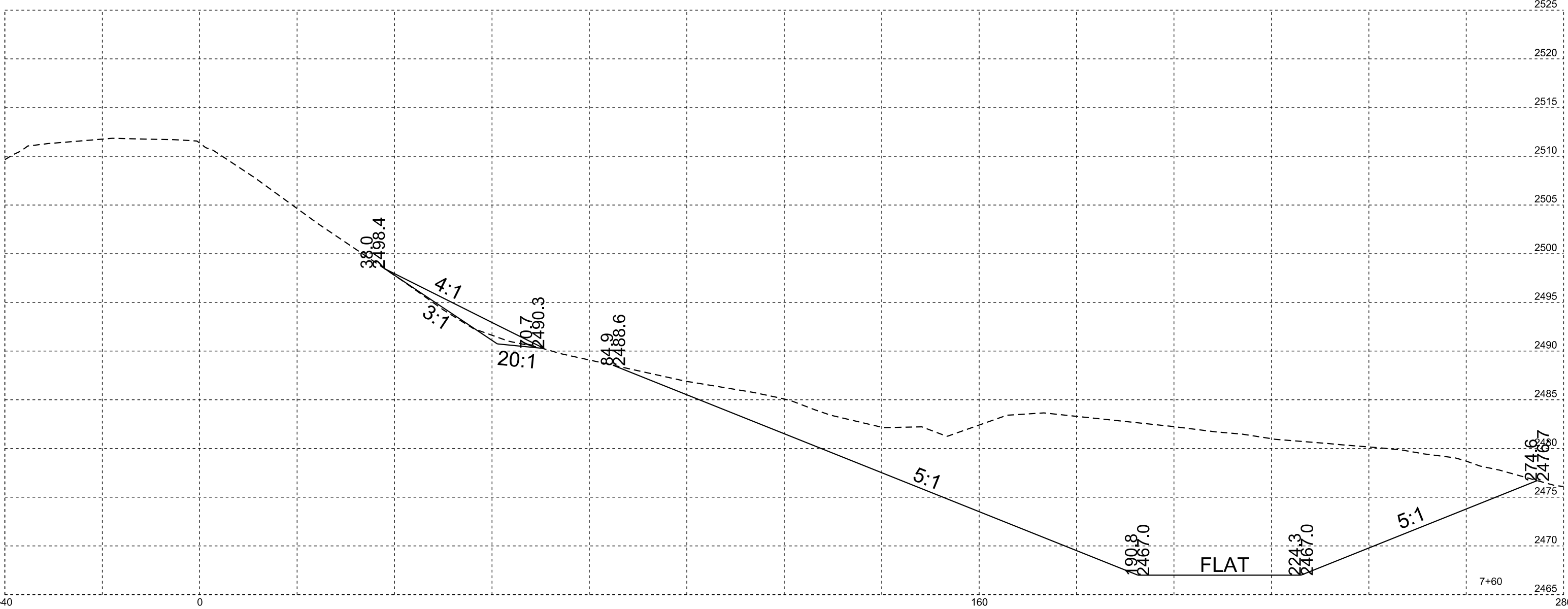


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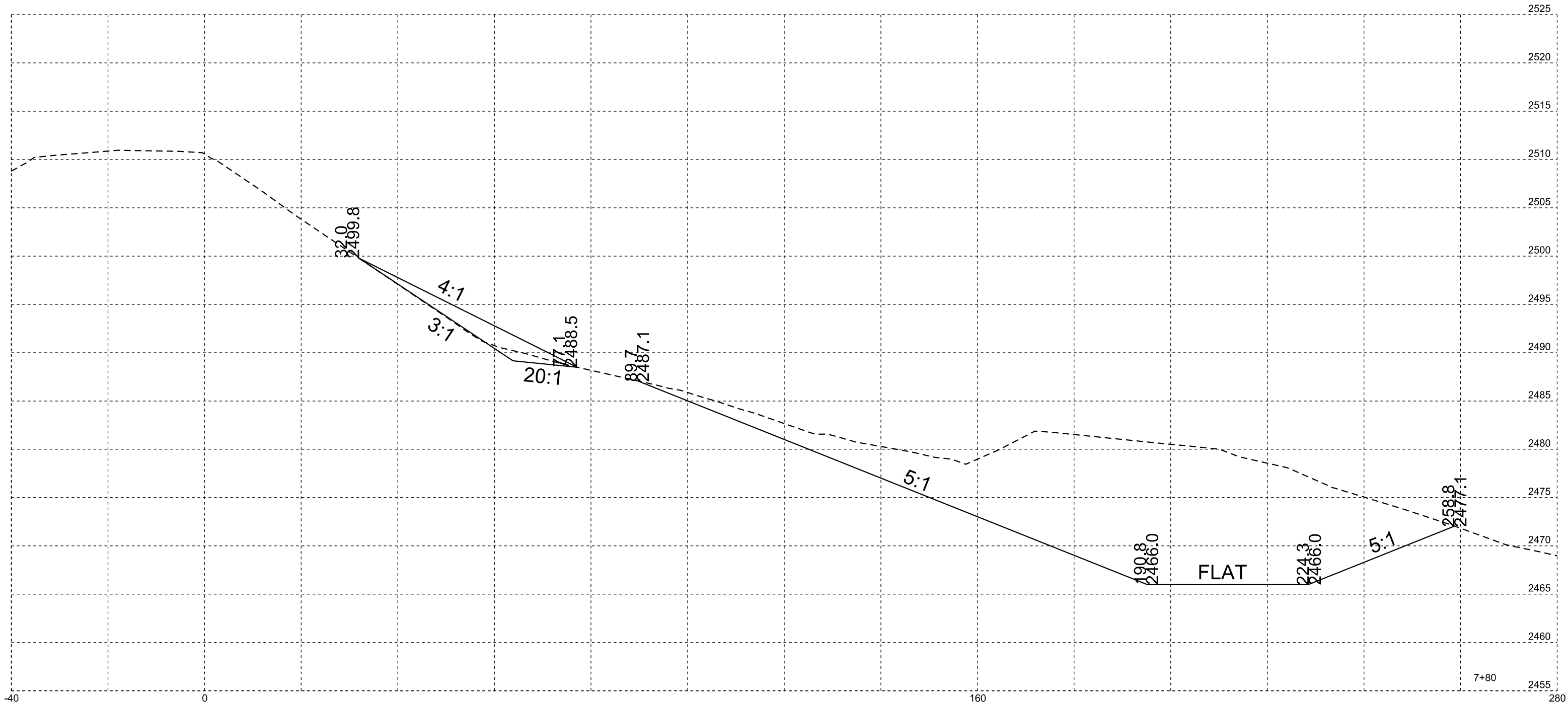


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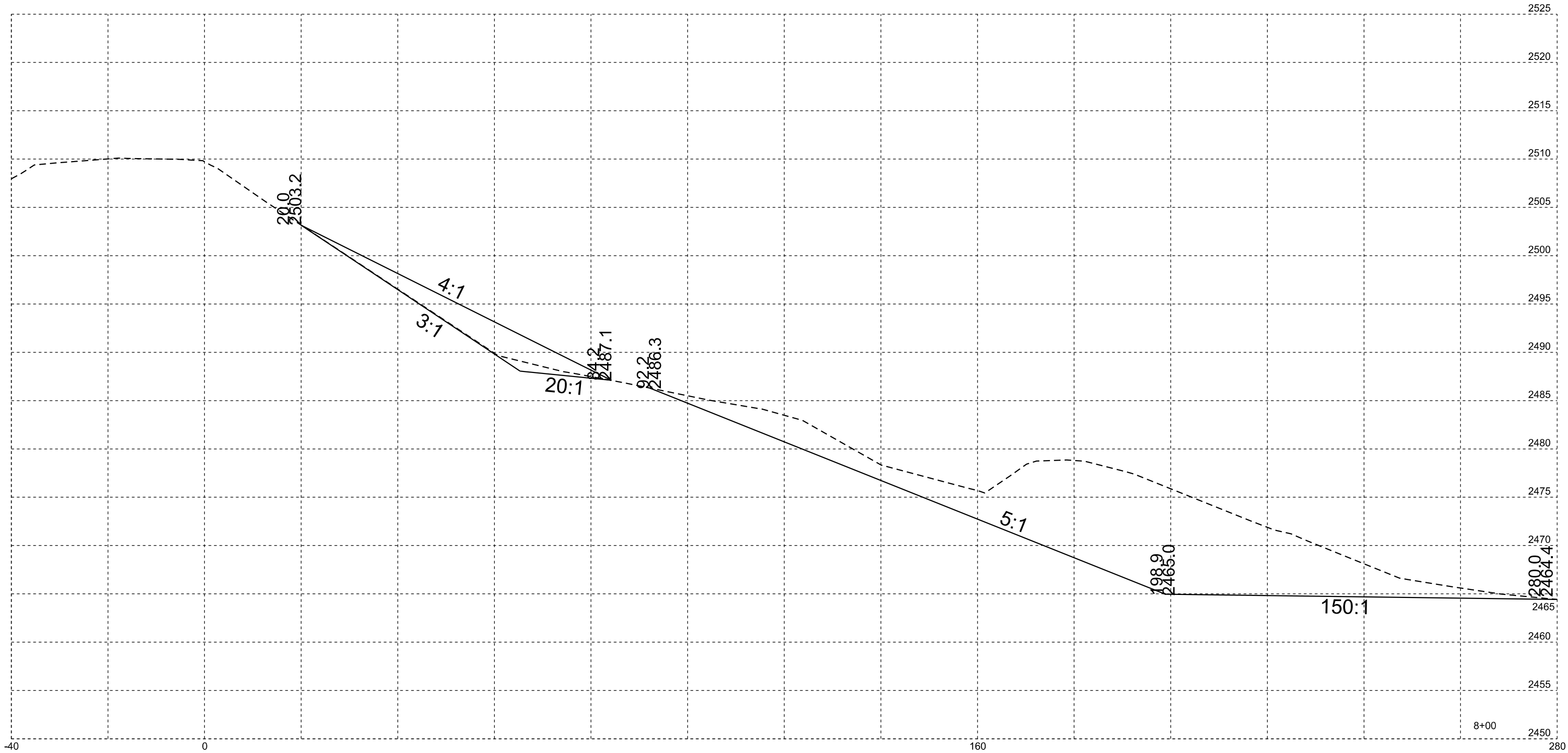


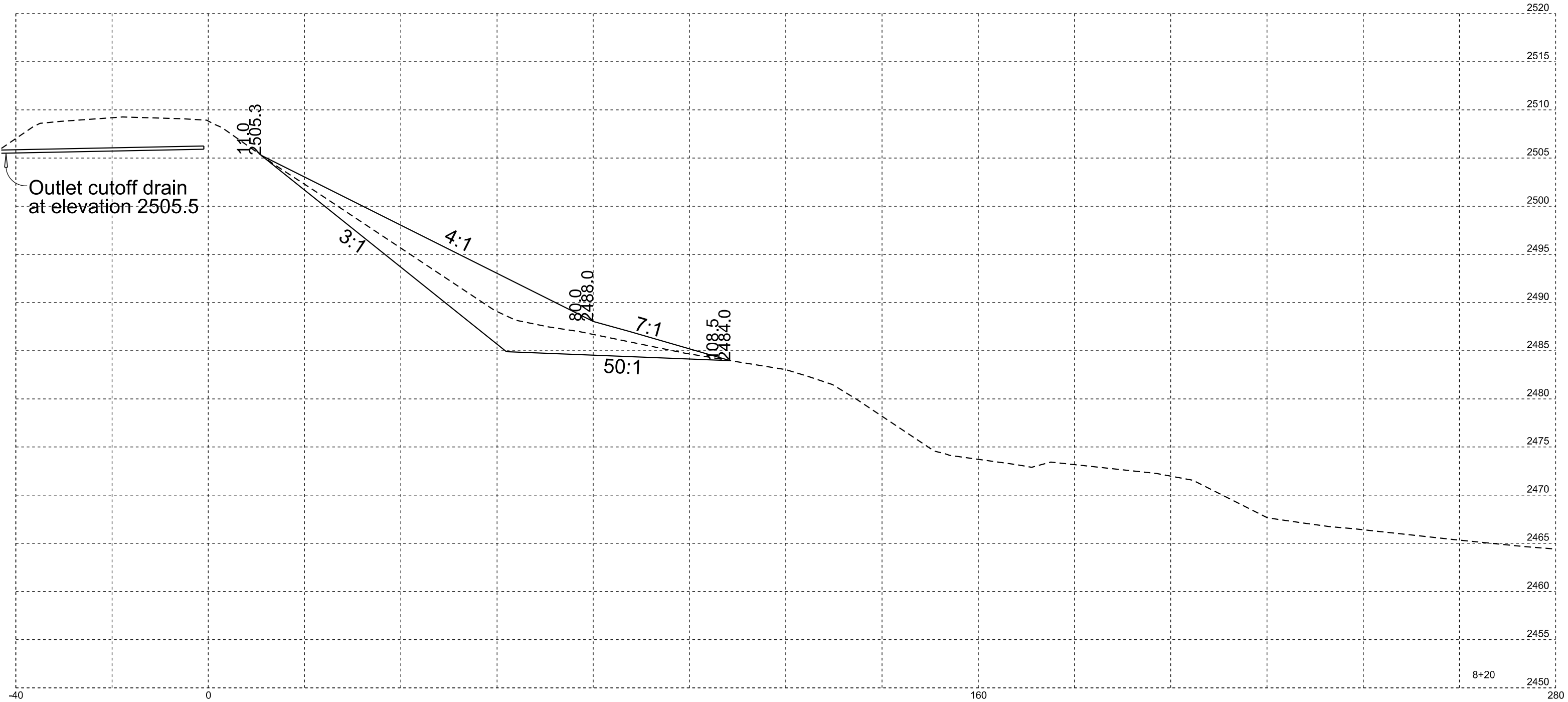


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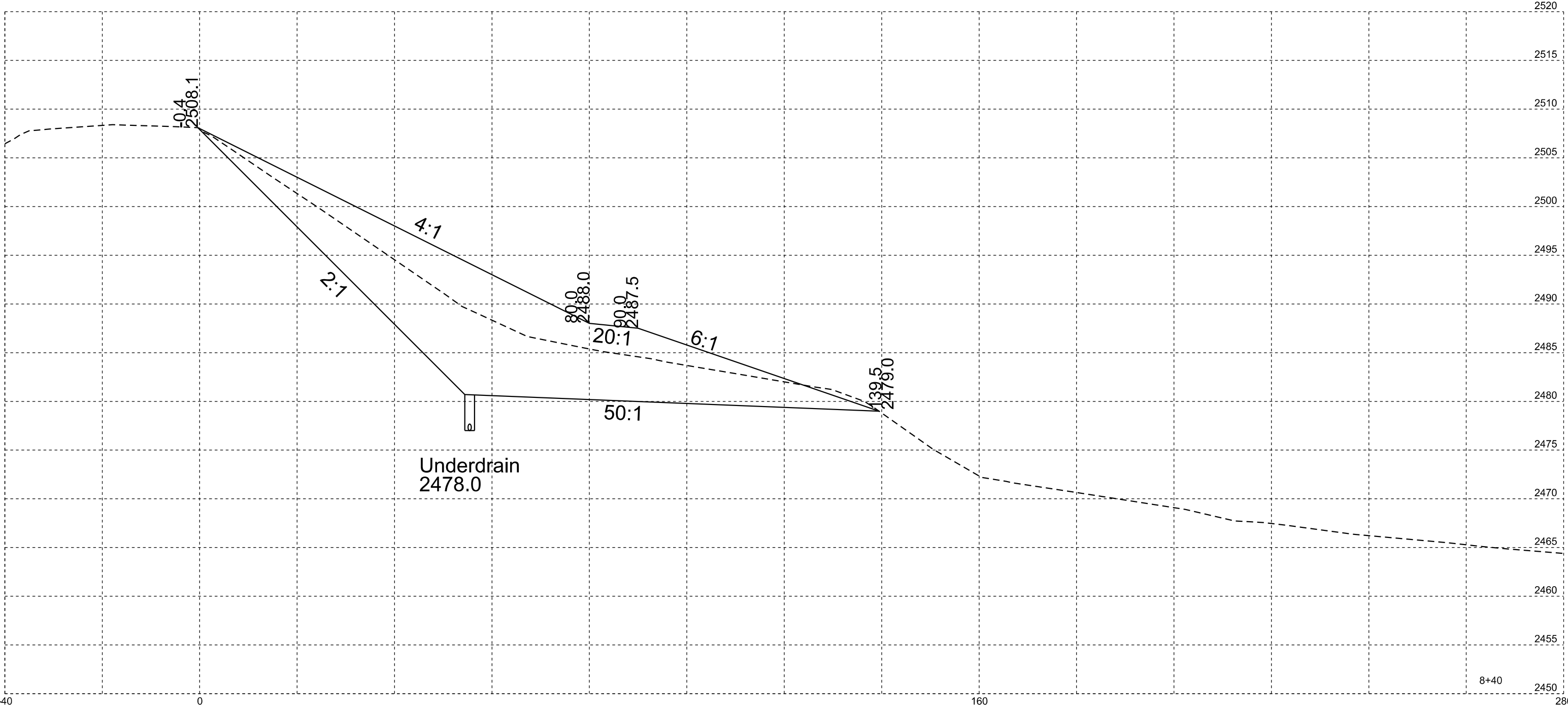


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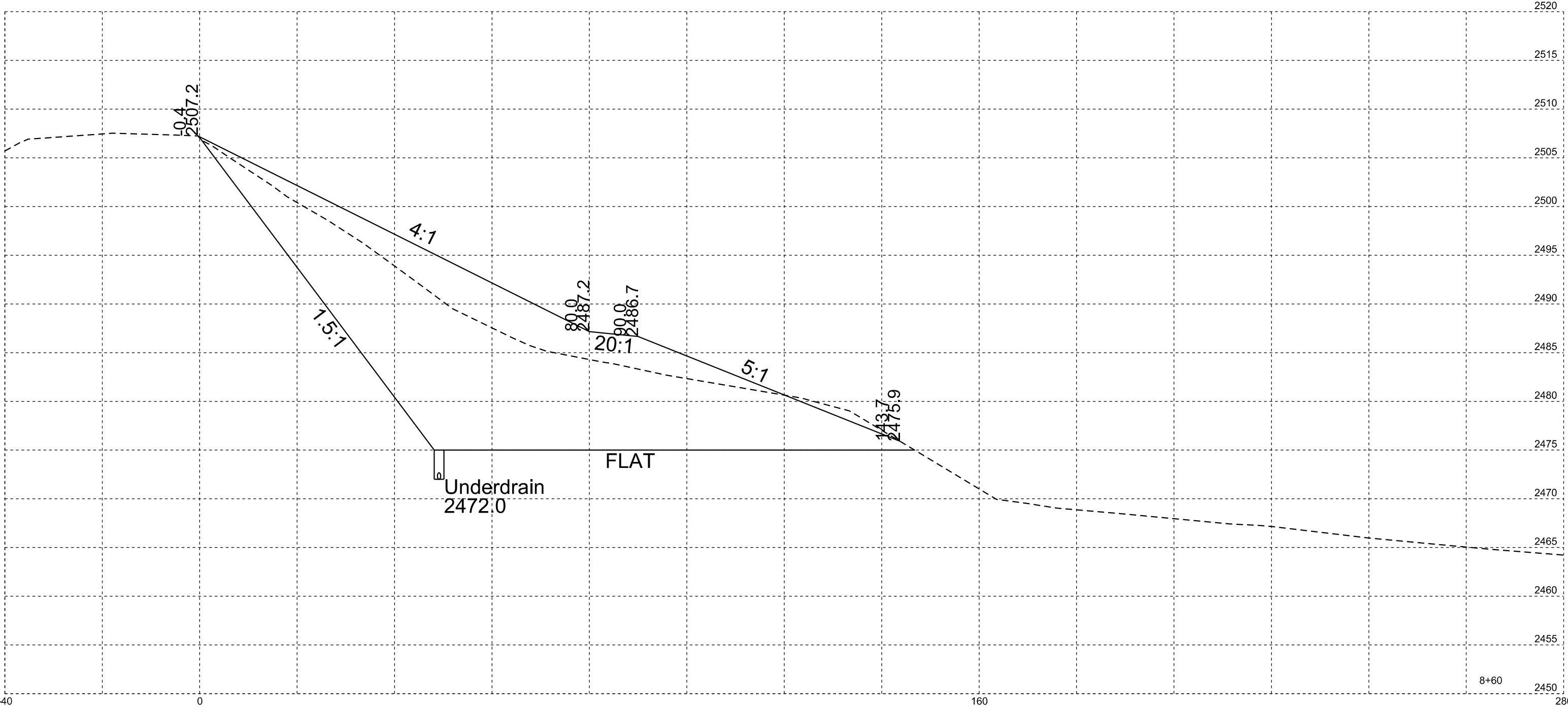




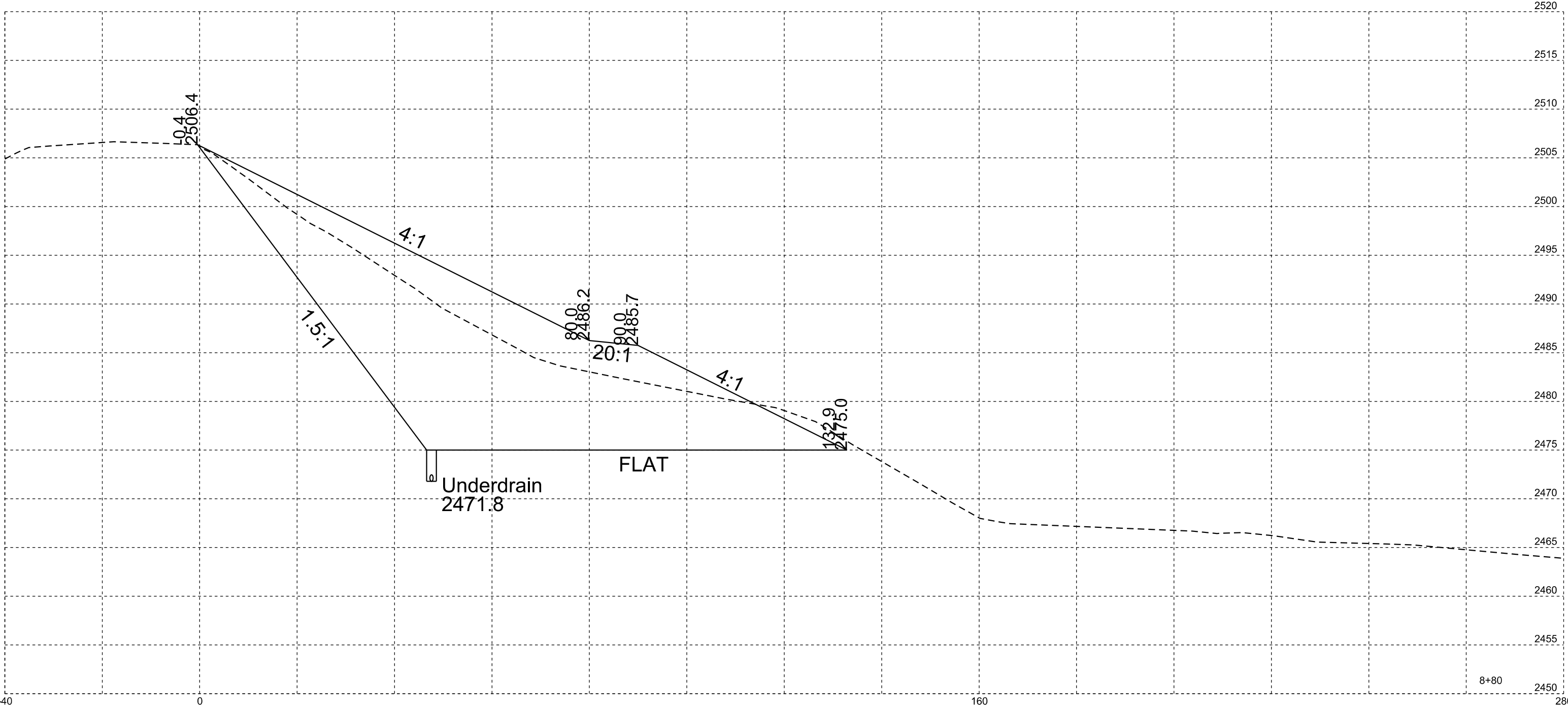
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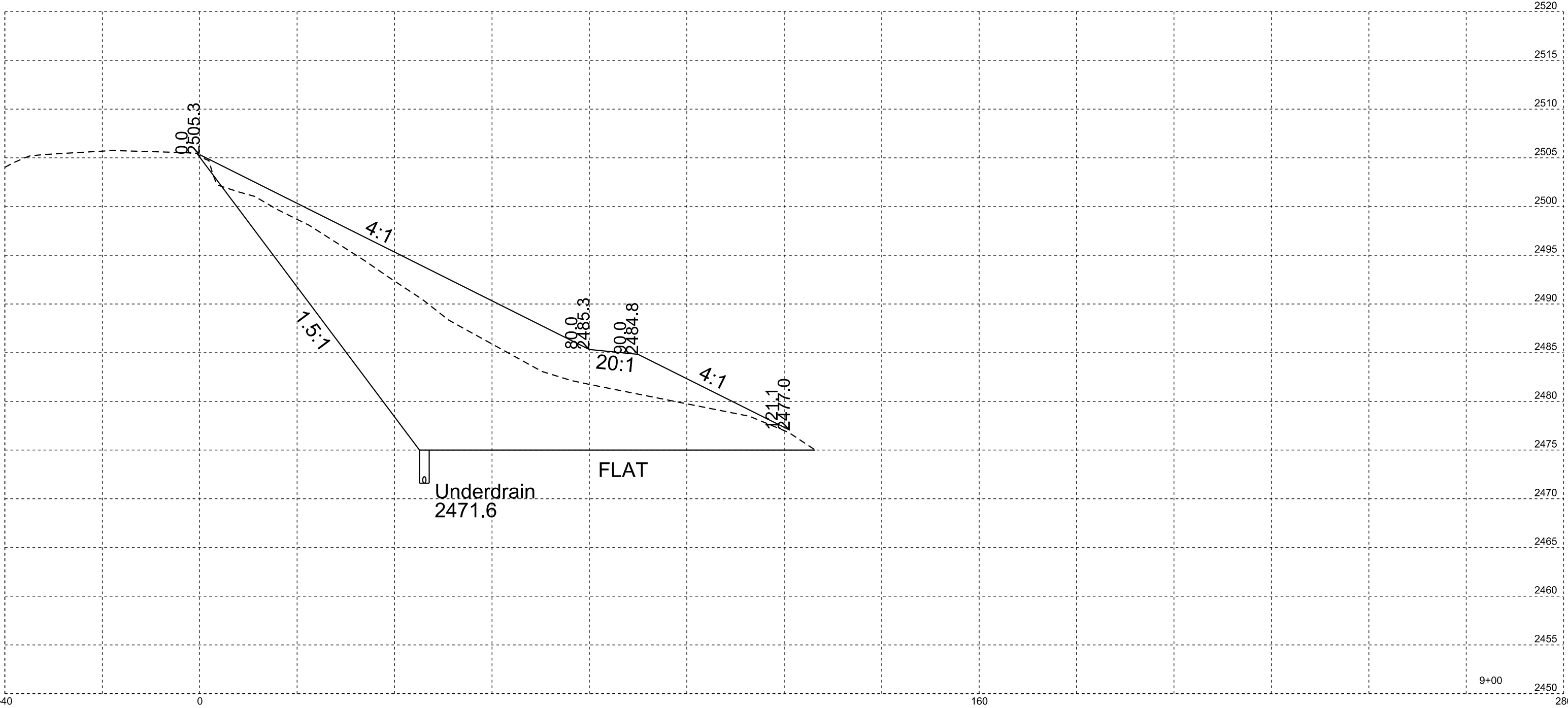


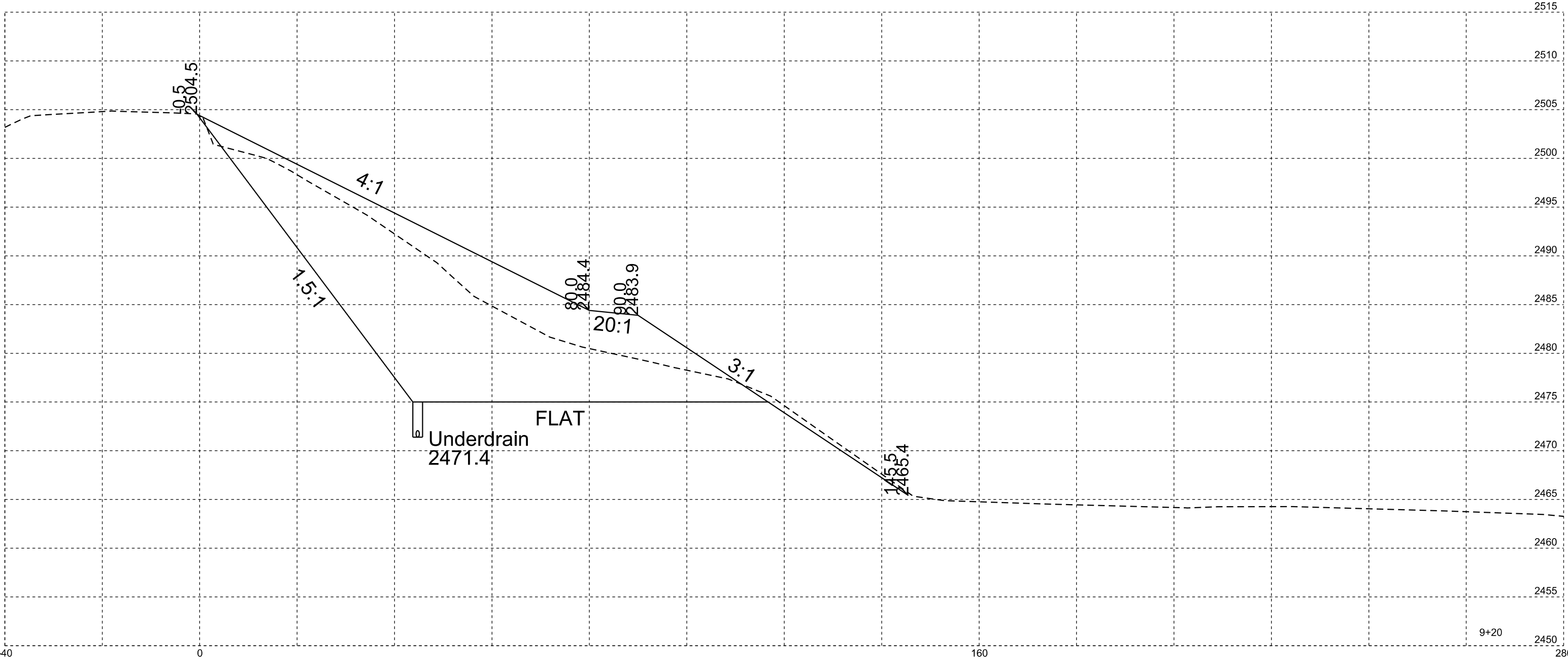
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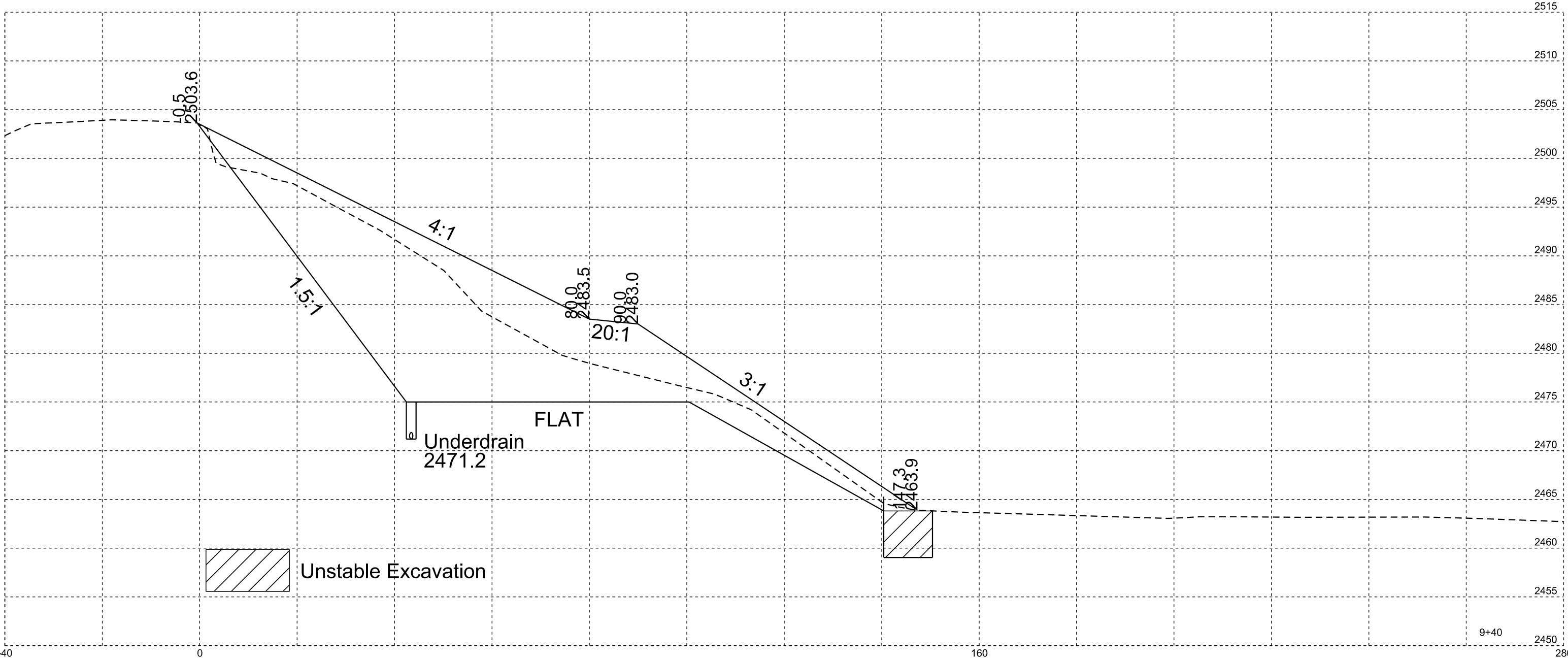


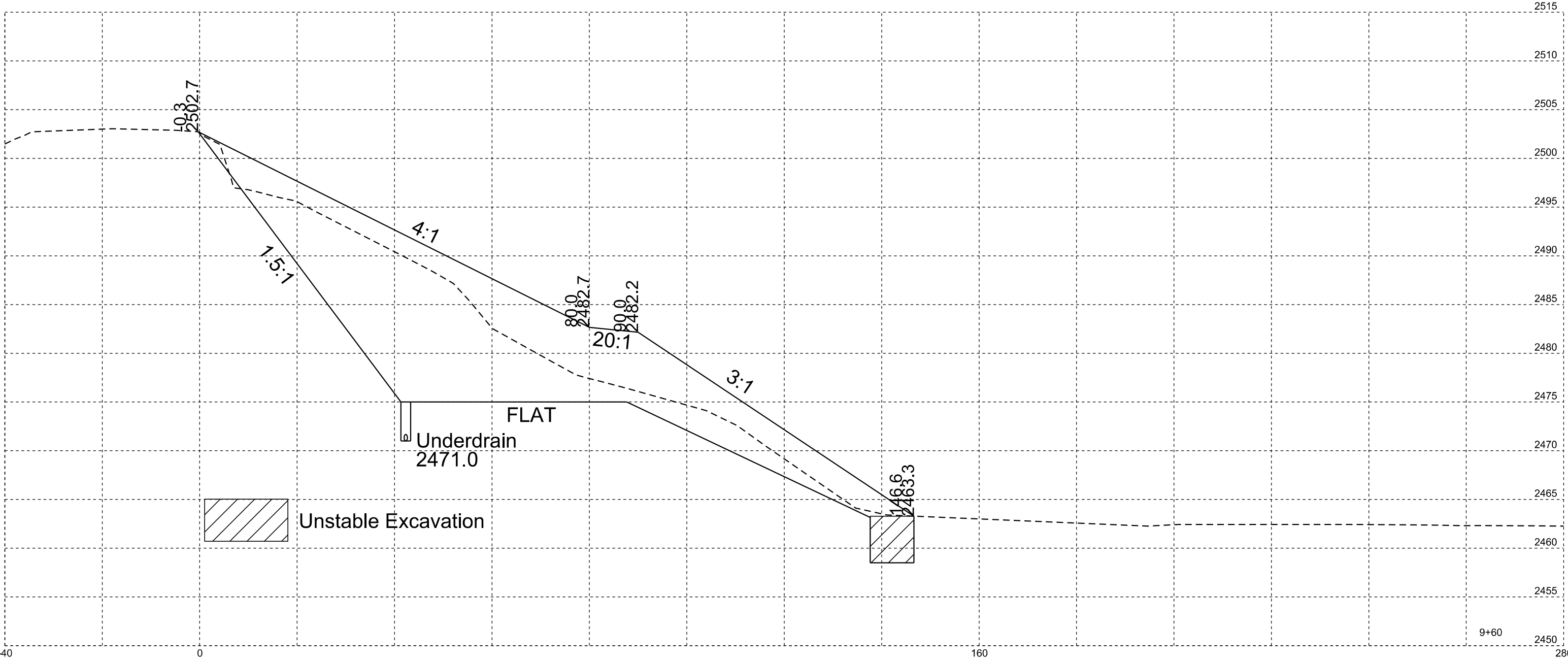
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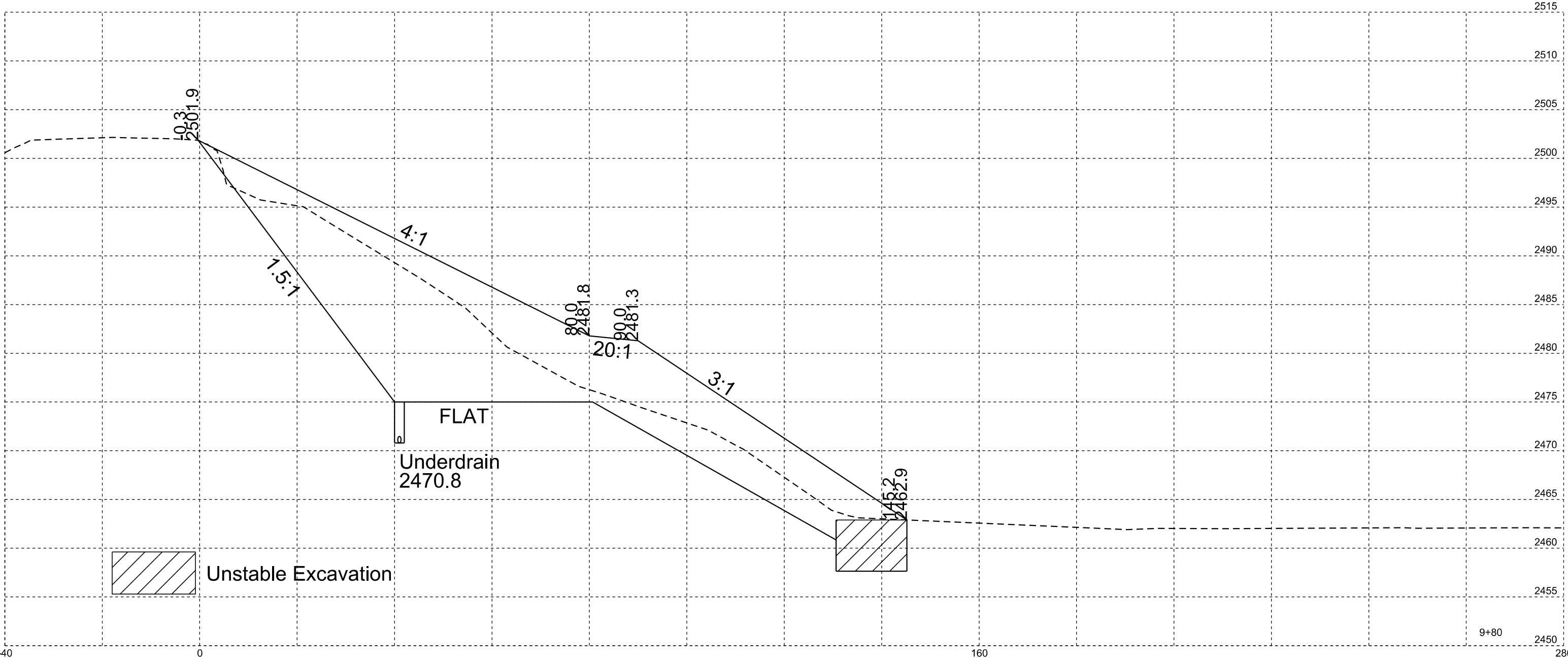


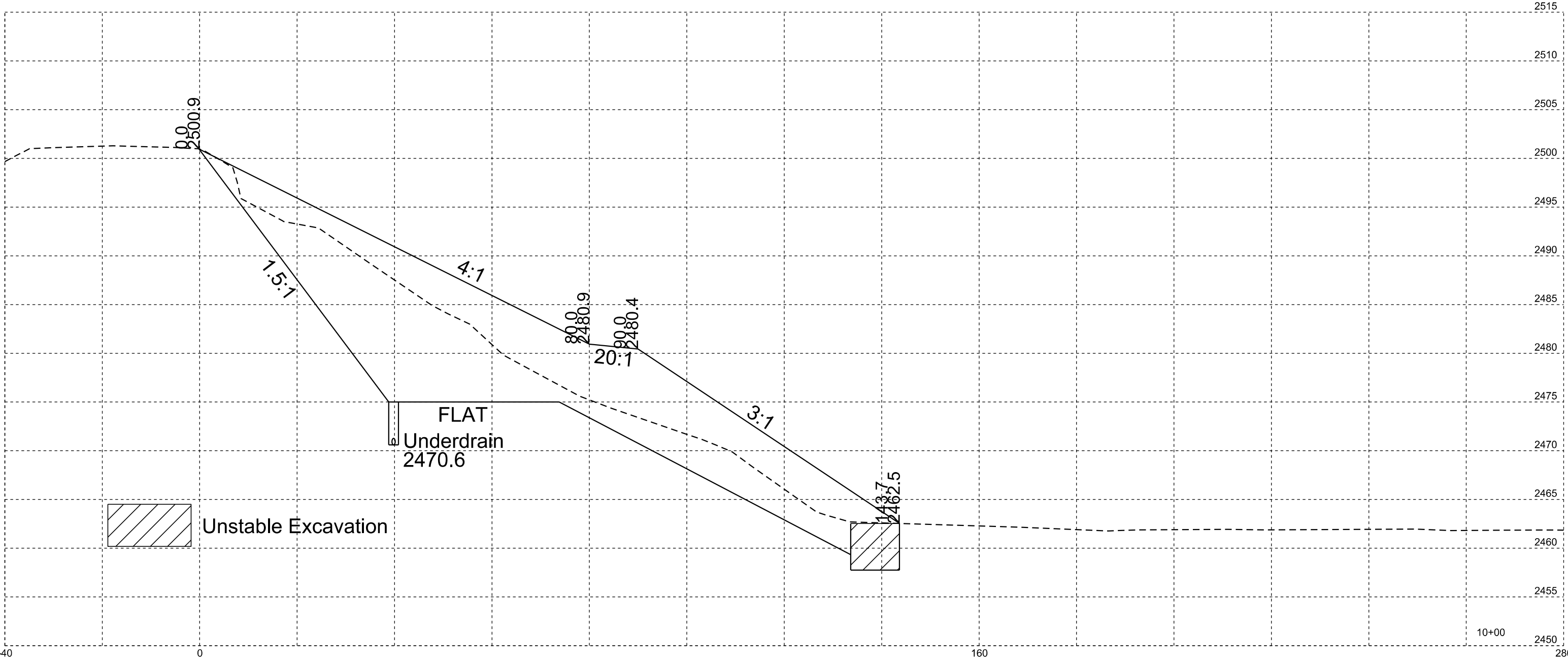


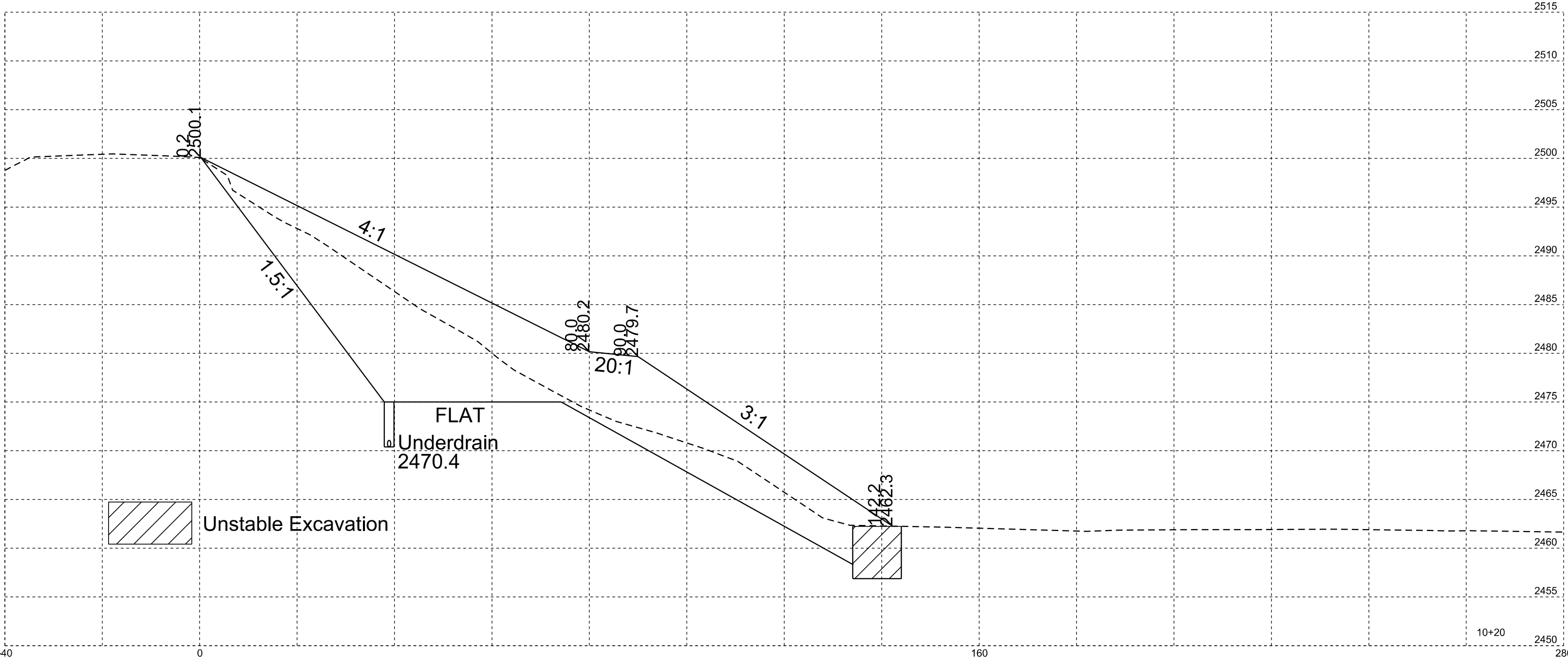




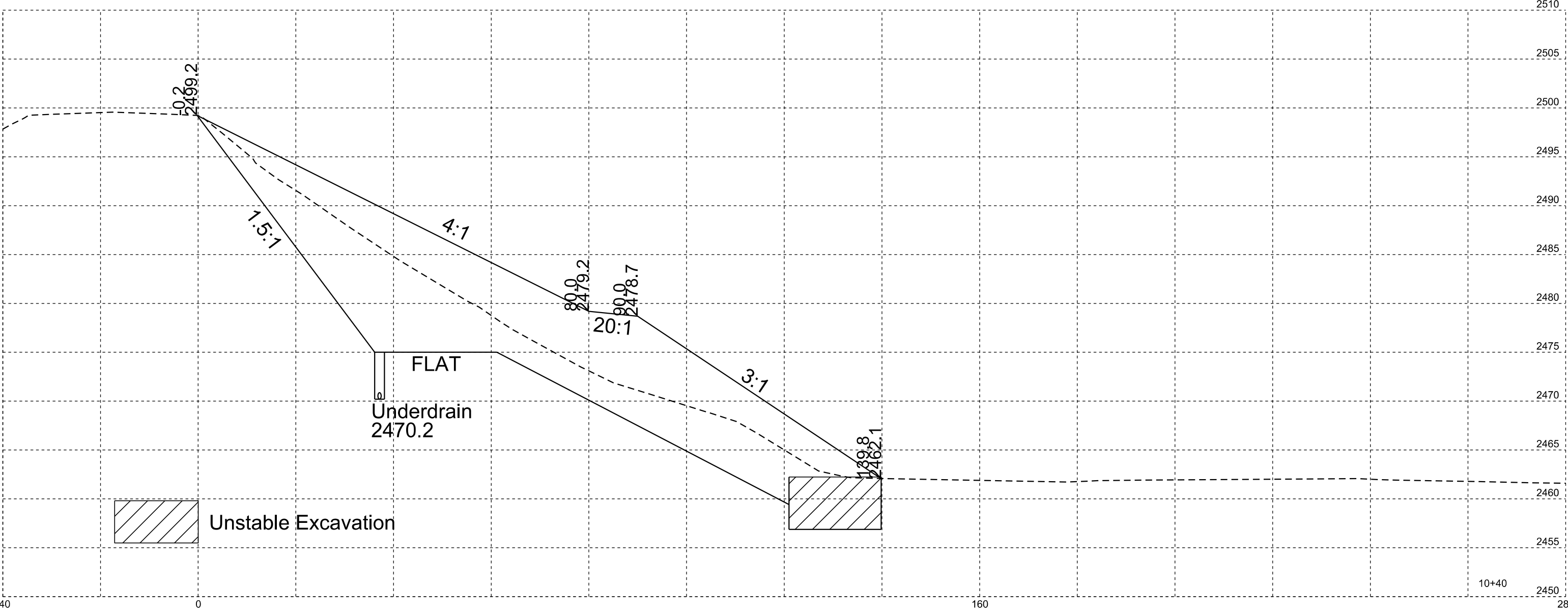


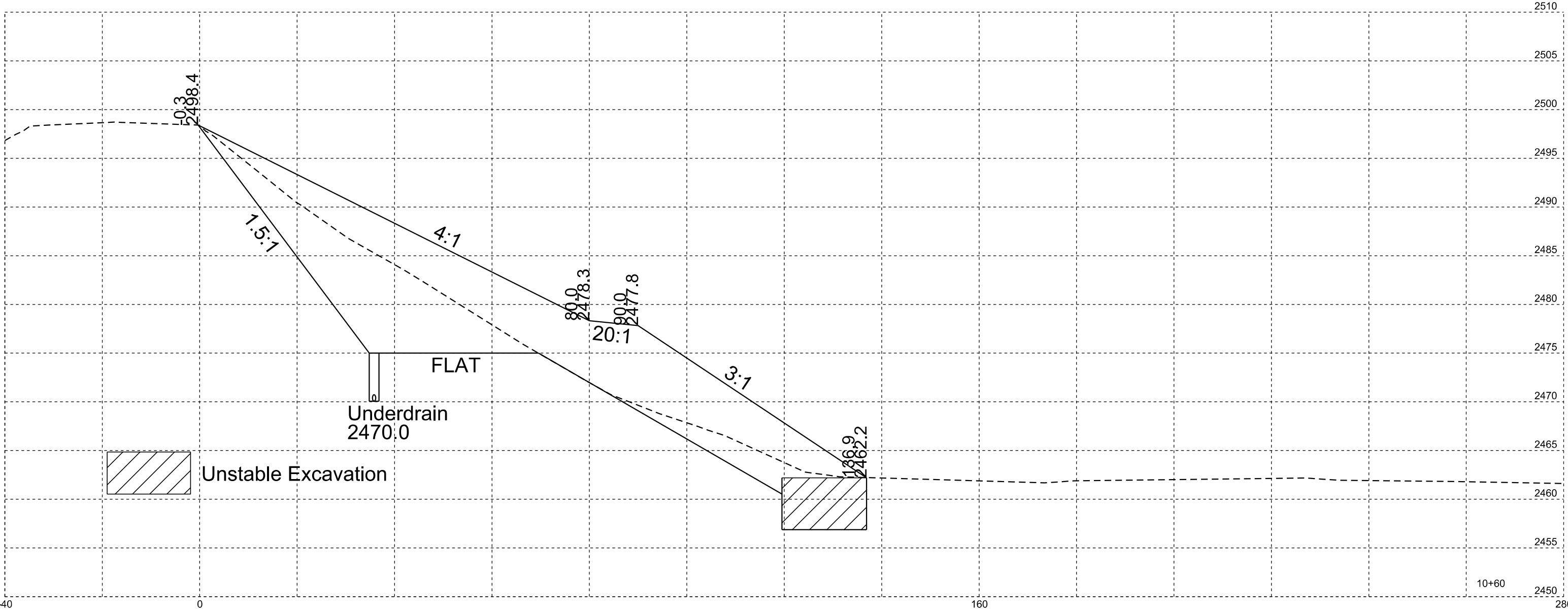


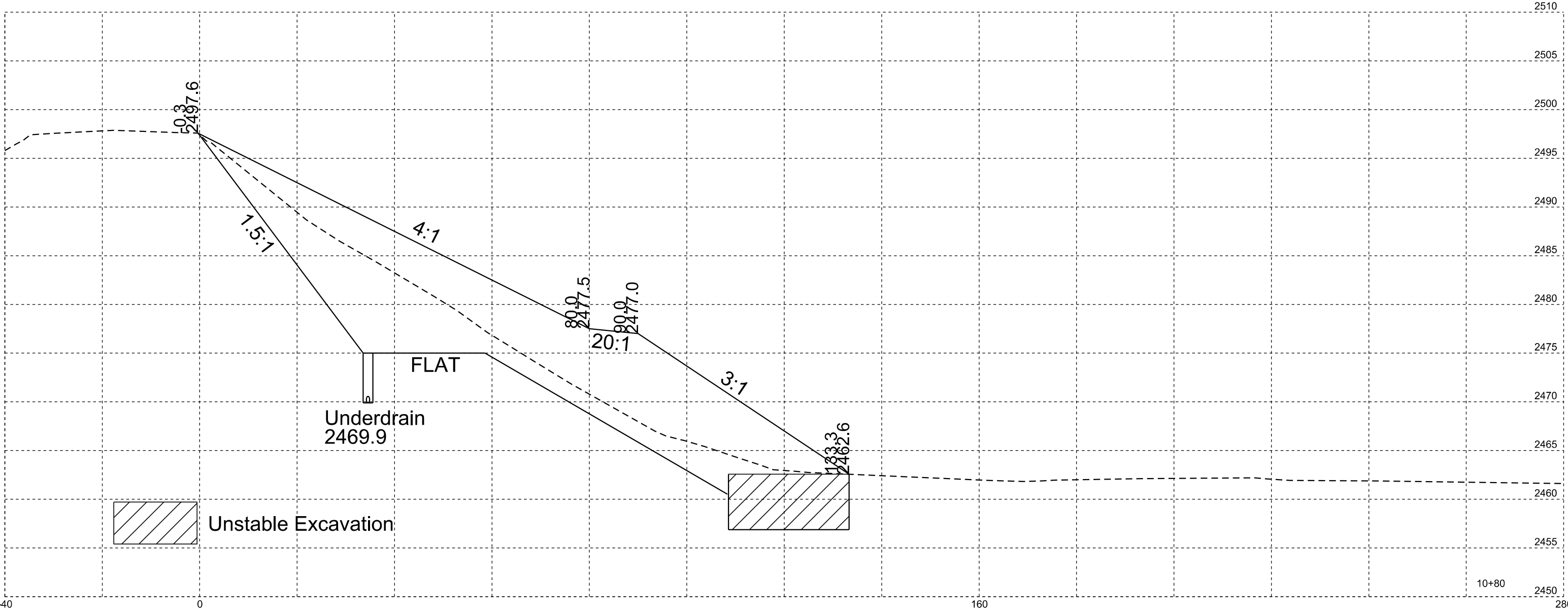


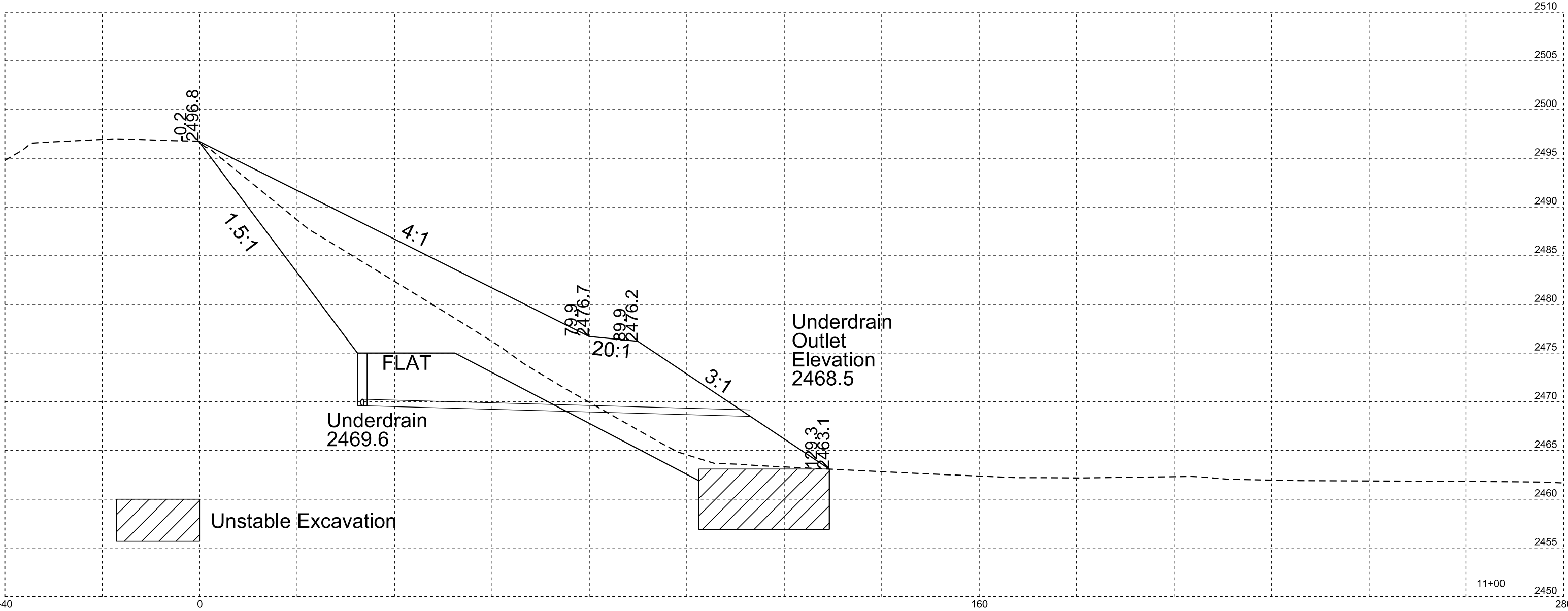


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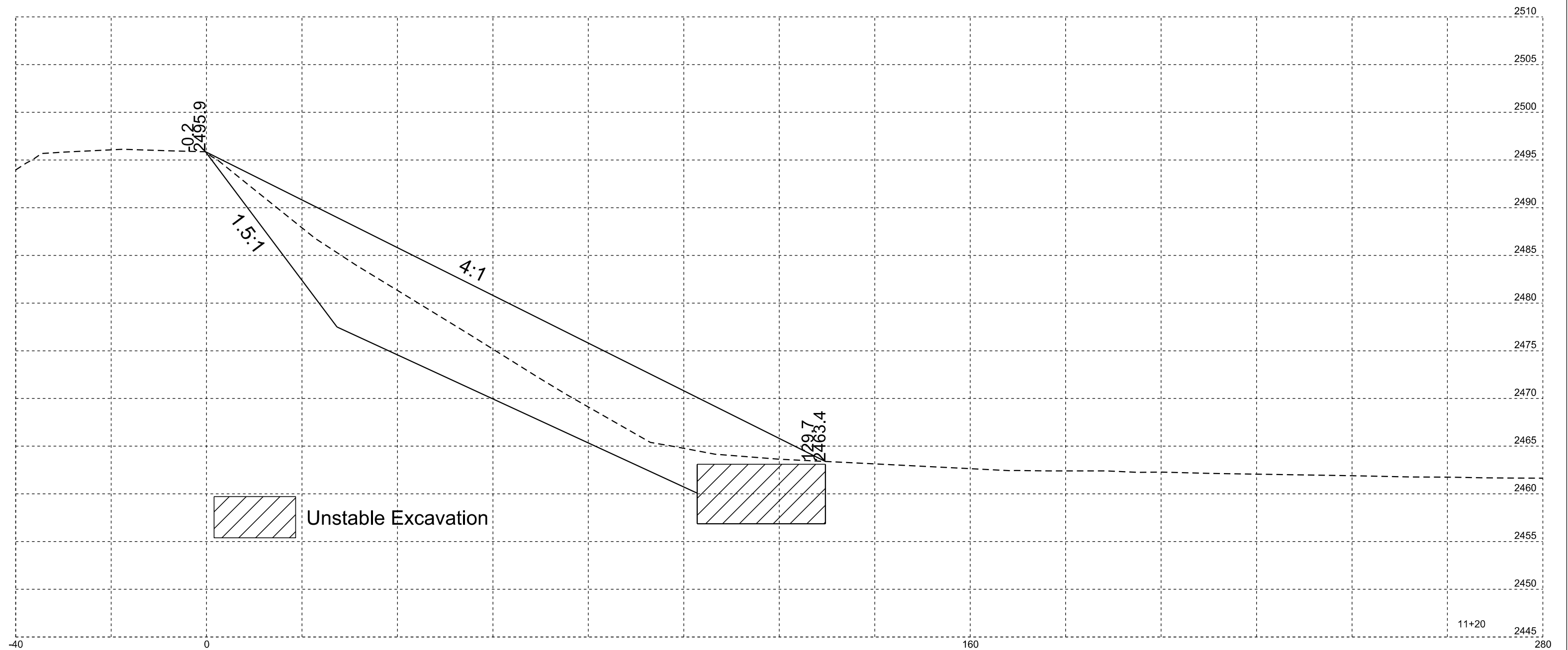




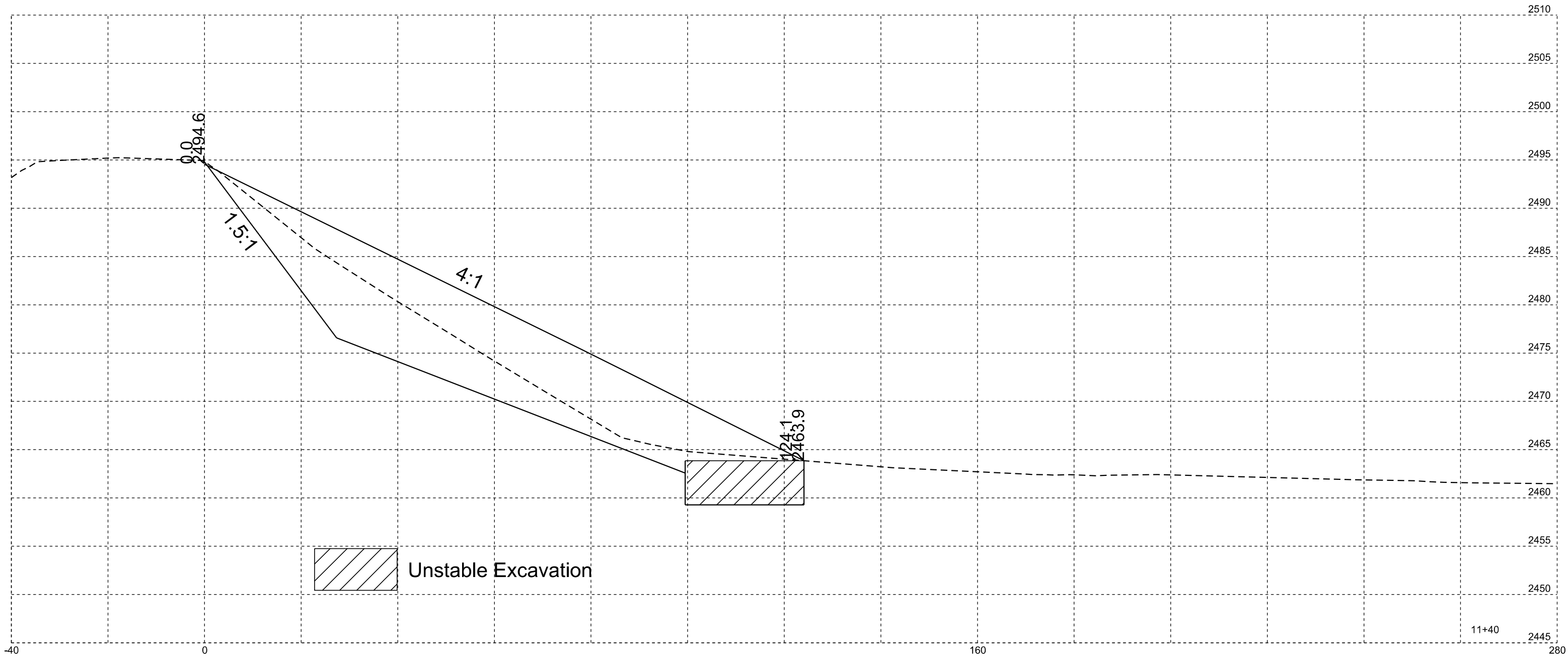




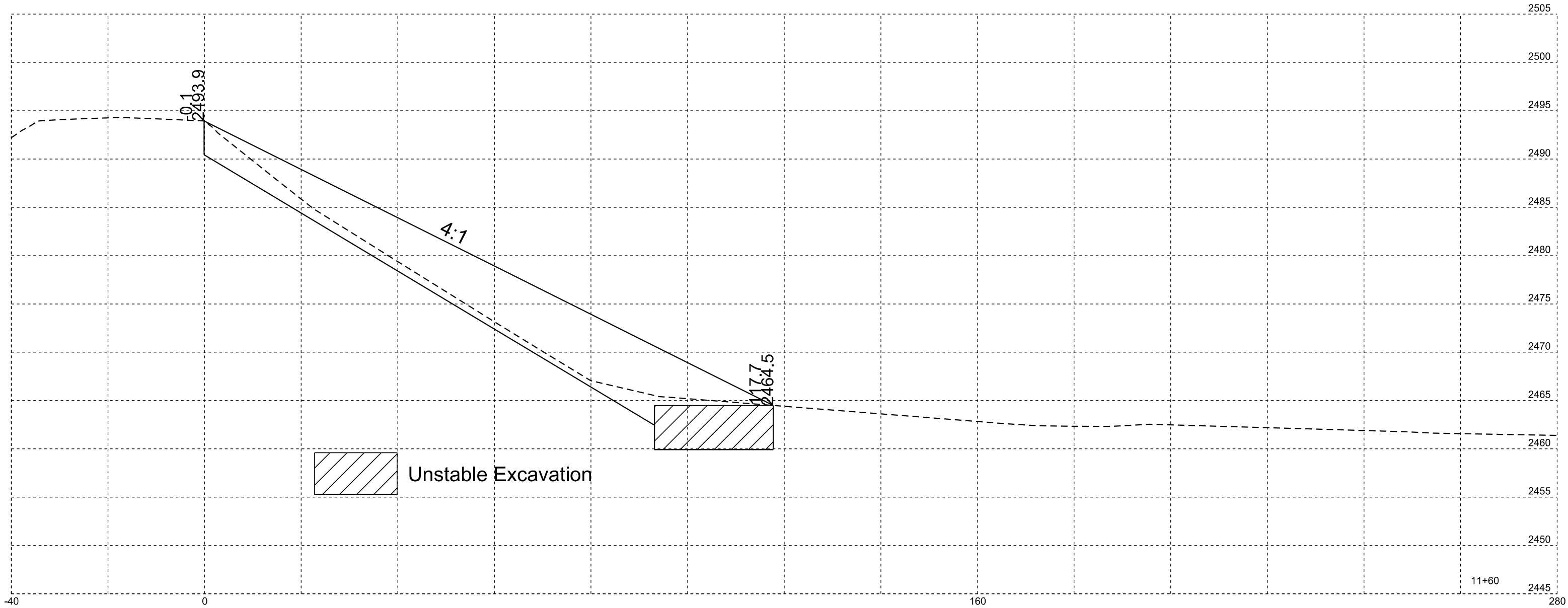
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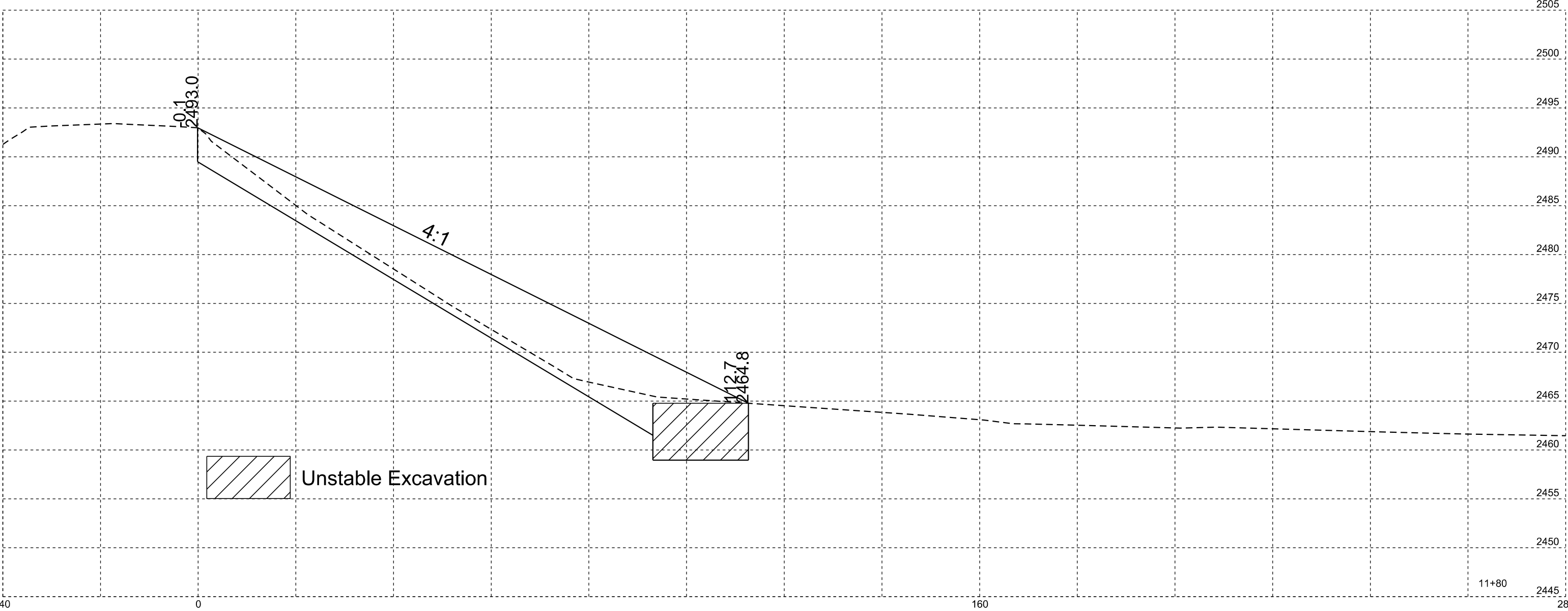


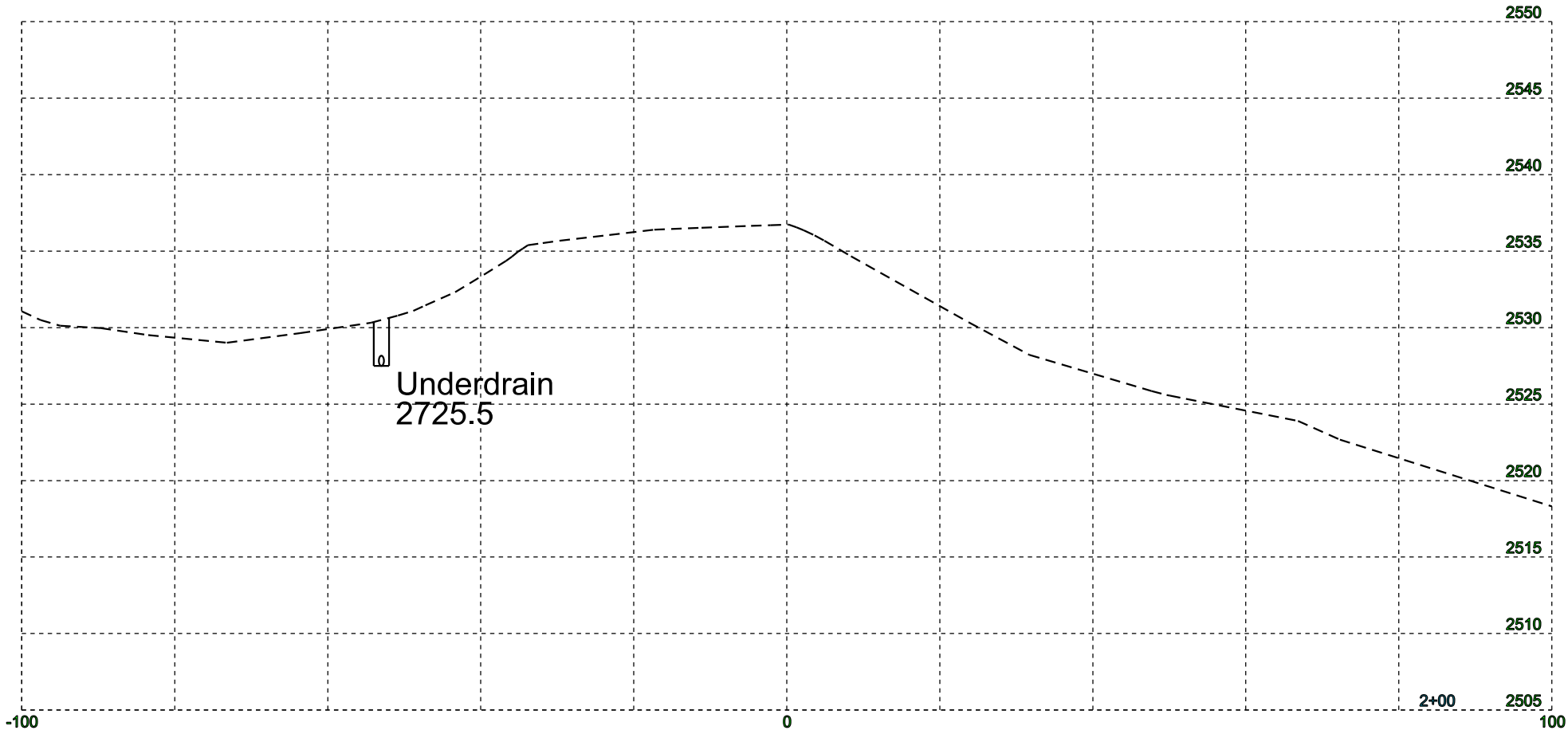
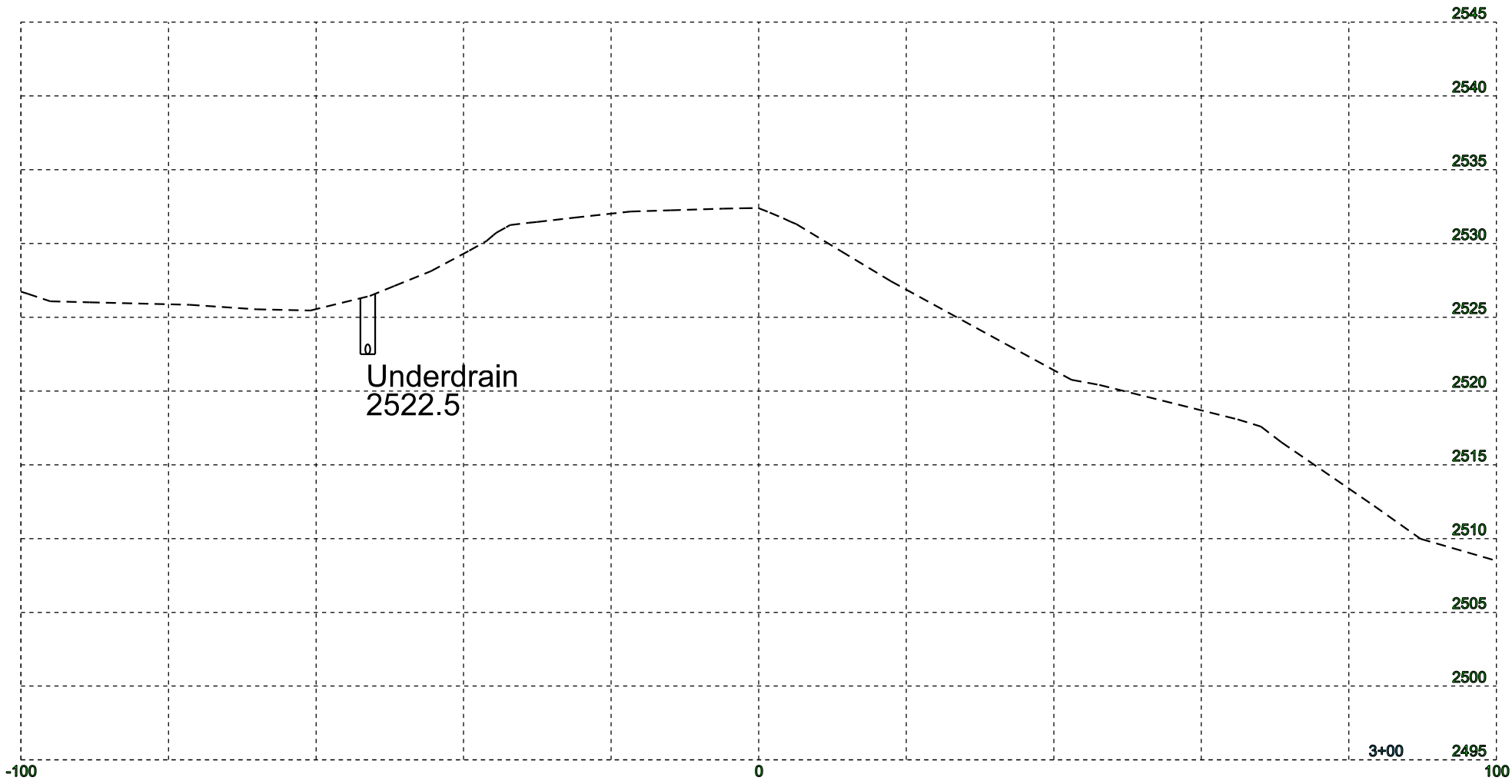
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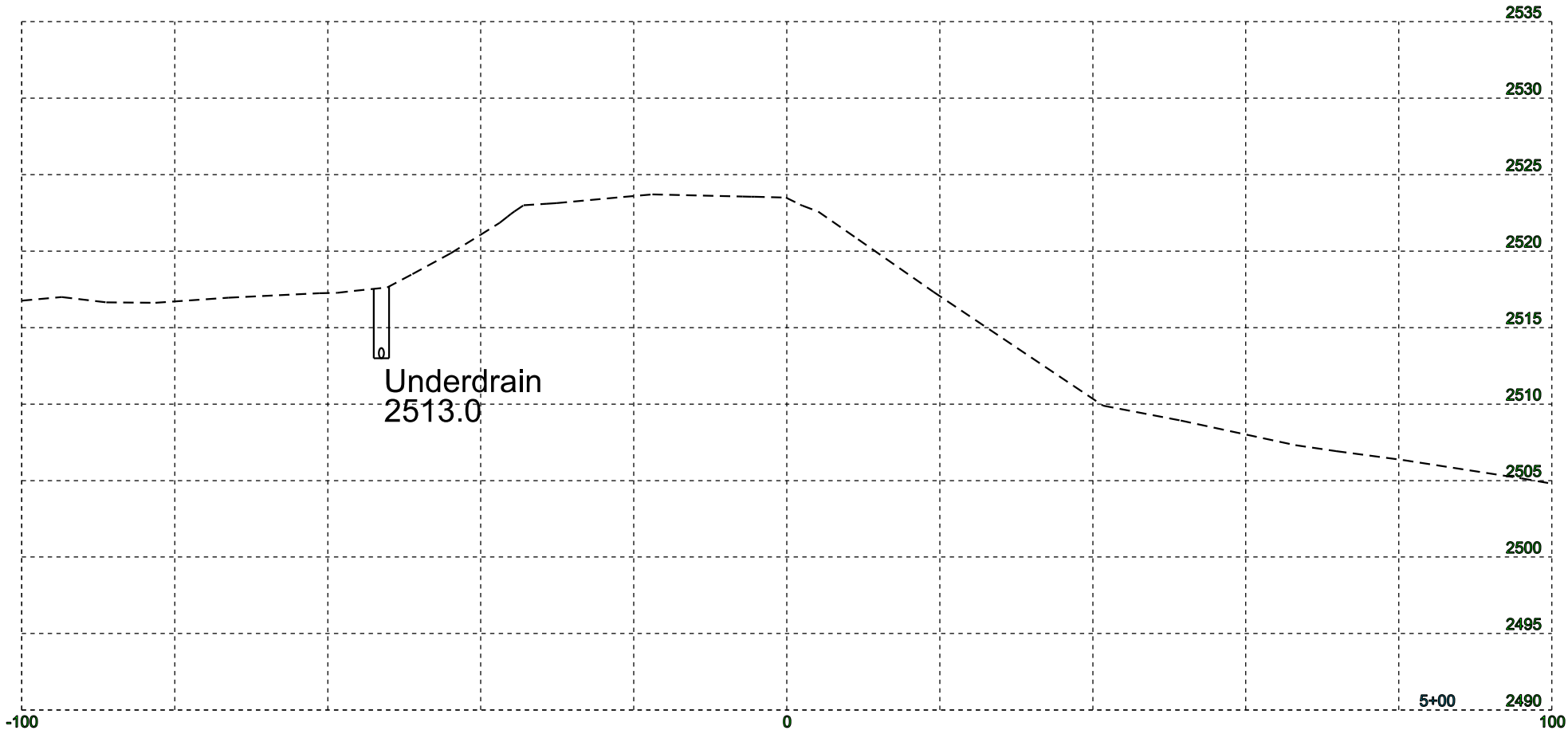
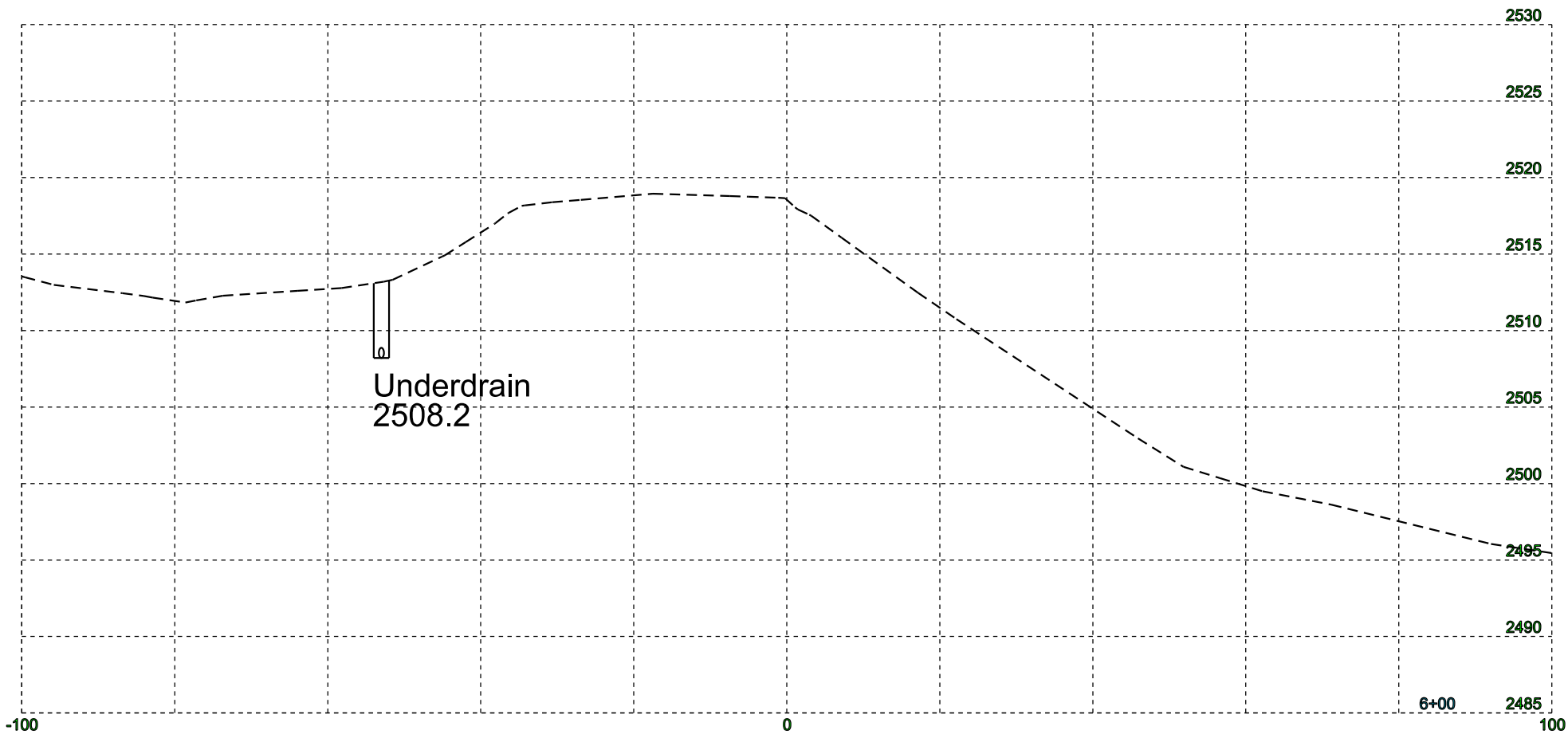
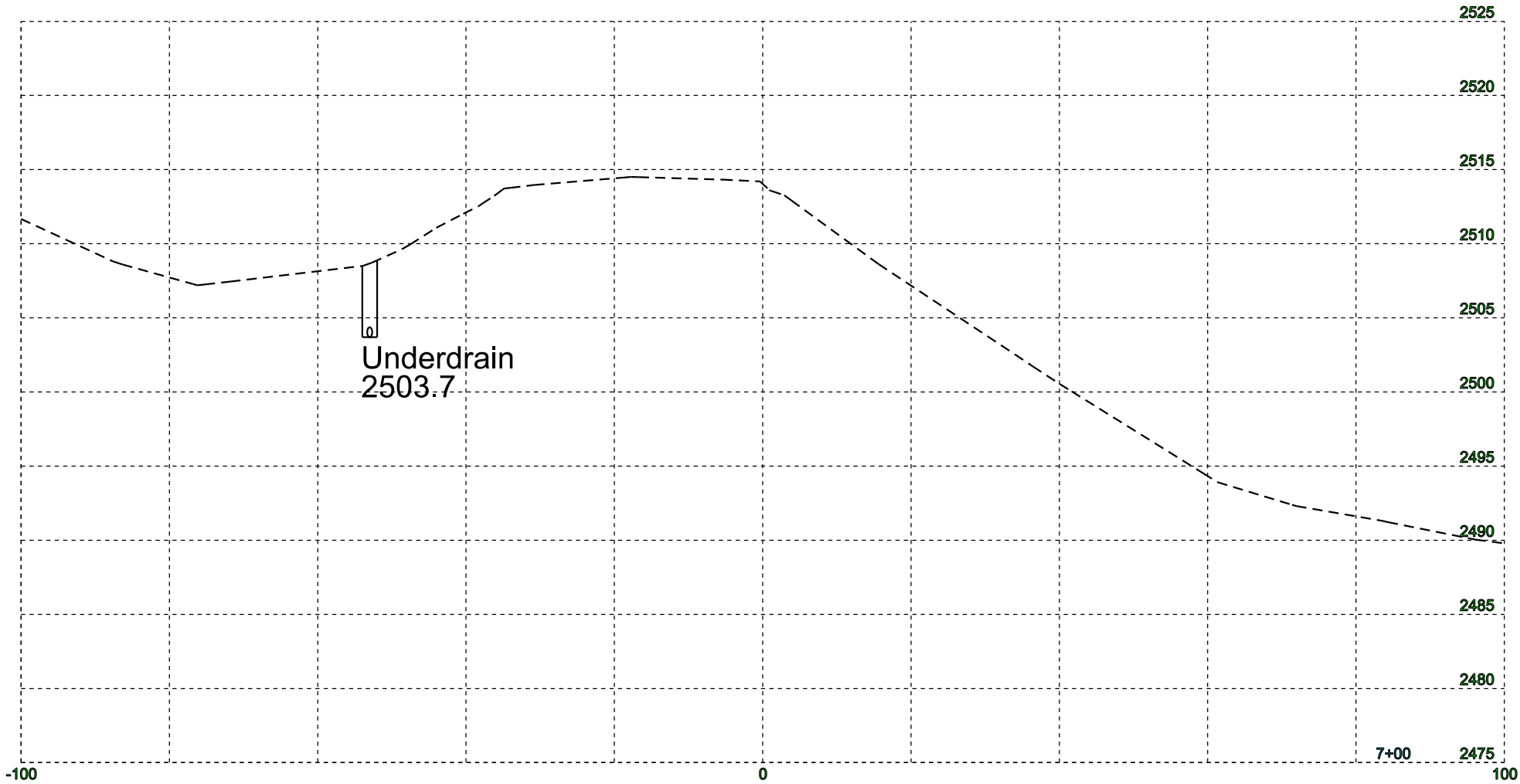


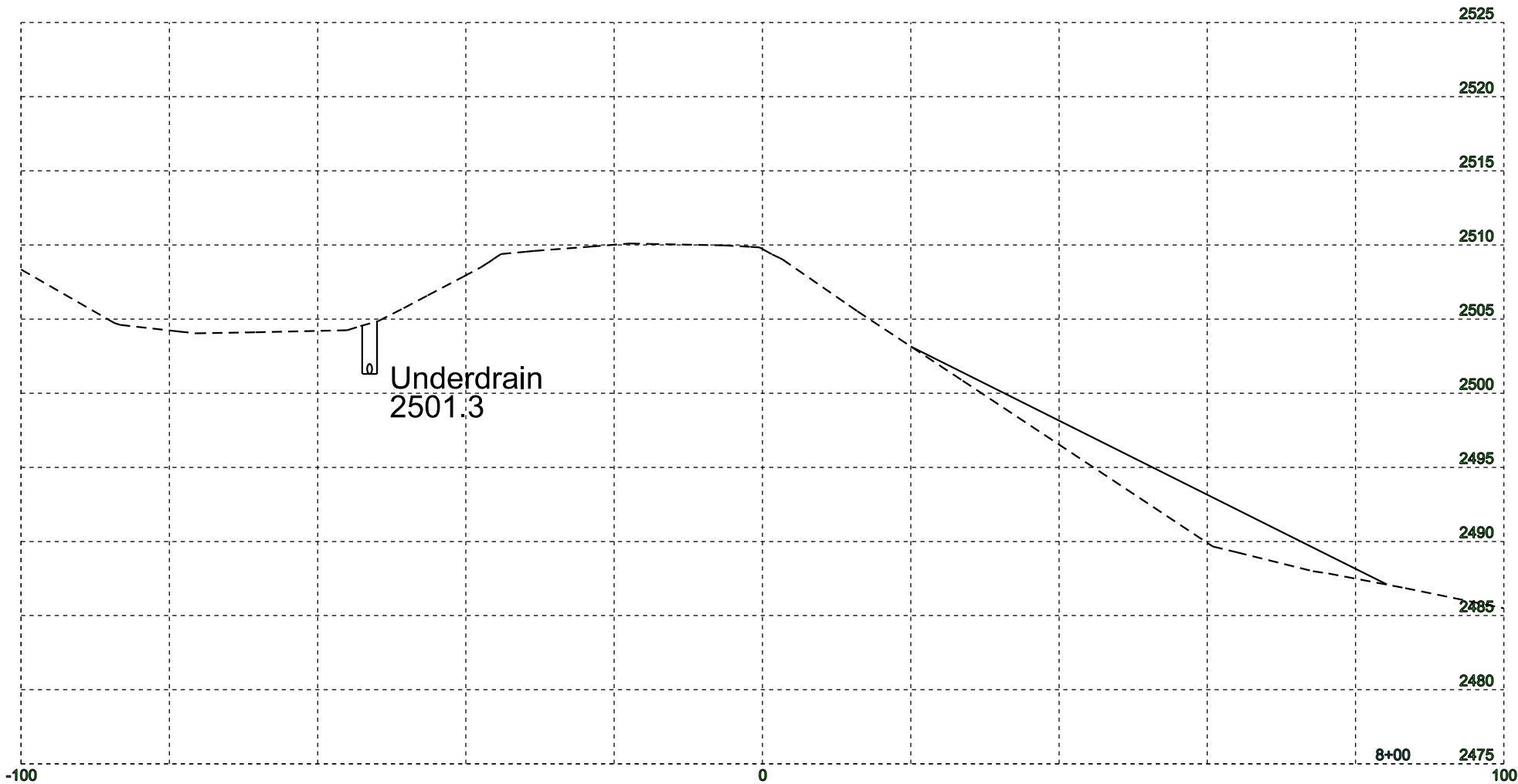
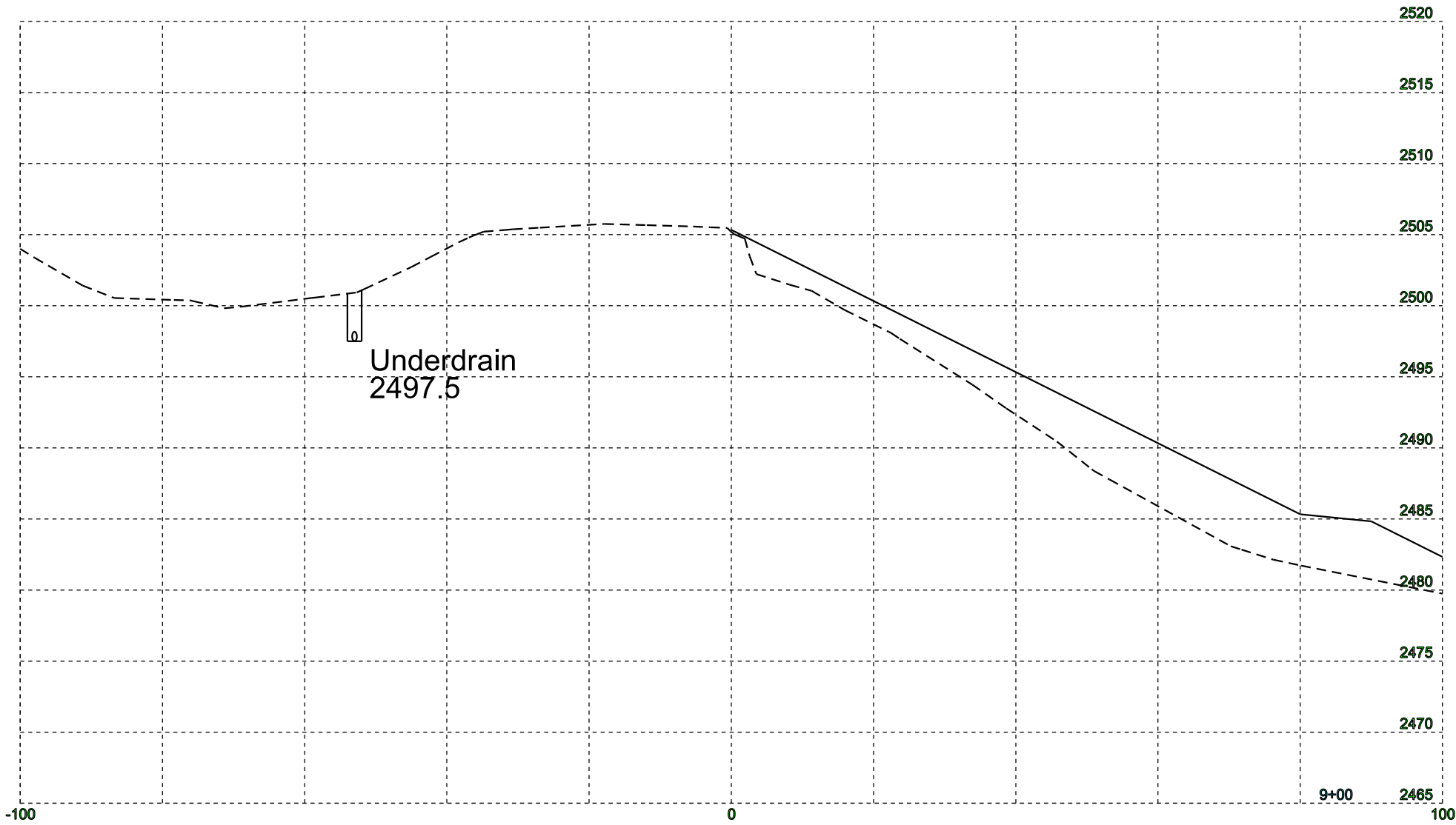
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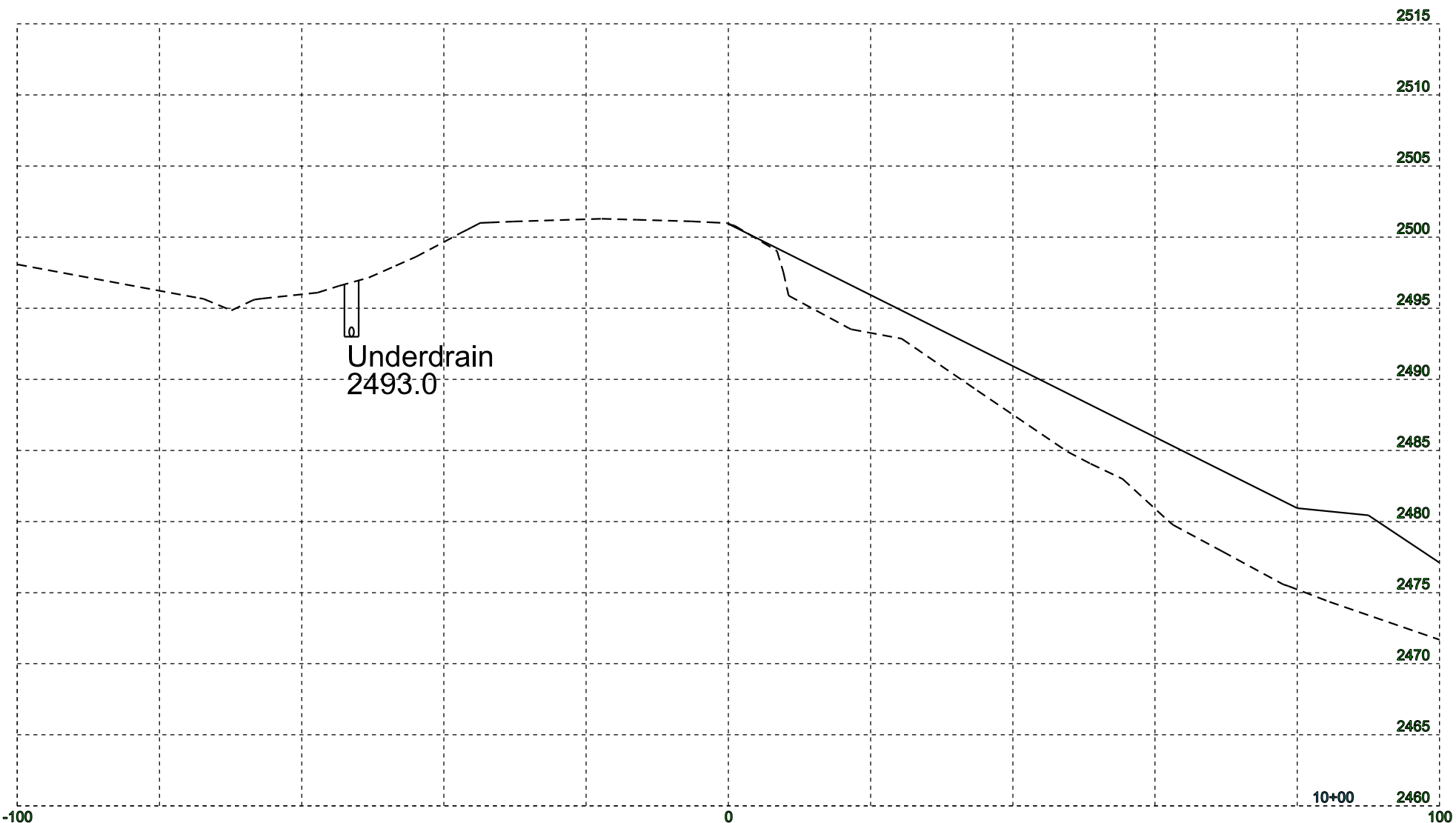
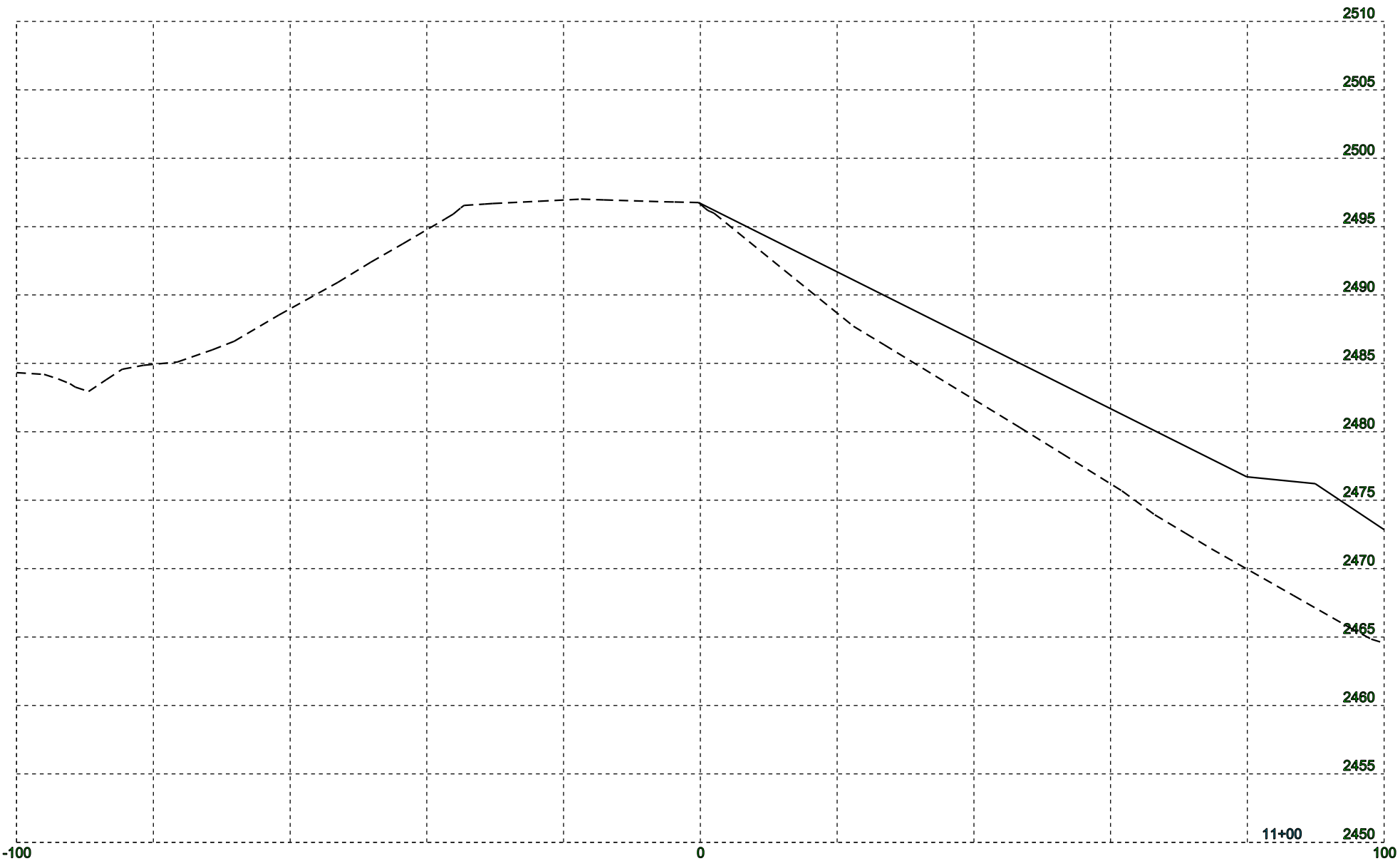












Plotting Date: mm-dd-yy

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| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
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